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A MONOGRAPH OF THE GENUS ACRANTHERA ARN. EX MEISN. (RUBIACEAE)

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With two text-figures

INTRODUCTION

A. THE IDENTITY OF PSILOBIUM JACK, ACRANTHERA ARN. EX MEISN. AND GONYANERA KHS.

JACK DESCRIBED IN 1822 (Mal. Misc. 2: 84) a new genus *Psilobium* based on two species discovered by him during his travels in Benkulen. The specimens which served for the descriptions have been lost. As the descriptions are rather short and give no measurements, it appears almost impossible to identify these plants. At least, as long as we are not absolutely sure that in this region not more than two species belonging to this genus occur, there can be little hope.

The genus was characterized in this way:

"*Psilobium* (W. J.); *Pentandria Monogynia;* N. O. *Rubiaceae* Juss.

Calyx patens, 5-partitus. Corolla tubo brevi, limbo 5-partito. Stamina basi corollae inserta. Stigma clavatum, 10-alatum, exsertum. Fructus cylindricus, siliquaeformis, foliolis calycinis persistentibus coronatus, bilocularis, polyspermus. Semina duplici serie axi affixa.

Fruticosa, pedunculis axillaribus paucifloris, aestivatione valvata."

For the determination of its position the following points are of special importance: the many-seeded fruit, the valvate aestivation of the corolla-lobes, the insertion of the stamens at the base of the corolla-tube, the clavate "stigma" (in reality that part of the style is meant on which the pollen is temporarily deposited, and from which it is afterwards removed by visiting insects), and the presence in each of the ovary-cells of two parallel axial placentas. The many-seeded fruit and the valvate aestivation of the corolla-lobes, it is true, appear in a large number of genera, but the other characters are much more exclusive; in fact, there are but

two other genera in which the whole set has been observed. These genera are: *Acranthera* Arn. ex Meisn. and the very imperfectly known *Gonyanera* Khs., the first based on a Ceylonese plant, the latter, like *Psilobium*, on a Sumatran plant.

It may be that Arnott when he described his new genus *Acranthera*, was not aware of the existence of *Psilobium* Jack, but it is also possible that he overrated the importance of the differences between the species on which his own and Jack's generic diagnoses have been based. The latter concern the position of the inflorescences, the presence or absence of a disk, and the structure of the ovary and fruit. The inflorescence of the Ceylon plant is found between the upper leaves, its disk is large and bulbous, and its ovary and fruit are according to Arnott "pseudo-bilocular," i.e. provided with an incomplete septum. In the Sumatran plants, on the other hand, the inflorescences have been described as axillary. The presence of a disk is not mentioned in Jack's description, and we may therefore assume that this organ is either absent or inconspicuous, and the ovary and fruit apparently are completely bilocular. The difference in the structure of the ovary and fruit afterwards proved to be untrue, for the median rent observed by Arnott in the septum, was, as Stapf (in Trans. Linn. Soc. II. 4: 173. 1894) pointed out, due to rough handling. All the same, it does not appear that Arnott attached much value to this character, for the supposed incompleteness of the septum did not withhold him from considering *Acranthera* a near ally of *Mussaenda* L., in which the septum certainly can not be regarded as imperfect. The two other points of difference are, as I will show further on, real enough, and might be considered a sufficient base for generic distinction. The authors, however, who subsequently occupied themselves either with *Psilobium* or *Acranthera*, did not see them in this light, for they indiscriminately referred to each of these genera species with or without a disk and with the inflorescences at the end of the stem as well as with opposite inflorescences. The Sumatran species of *Acranthera* described by Merrill (in Papers Mich. Acad. Sci. 19: 194. 1934) e.g. are, exactly like the *Psilobium* species of Jack, provided with opposite inflorescences, whereas *Psilobium siamense* Kerr produces its inflorescence exactly like Arnott's *Acranthera* species, at the top of the stem, and is also, like the latter, provided with a large bulbous disk. The explanation of this anomaly lies therein that those who occupied themselves with *Psilobium*, were insufficiently acquainted with *Acranthera*, whereas those who described new species of the latter, gave no heed to the existence of *Psilobium*.

As long as no specimens were available which could be referred to *Psilobium*, the position of this genus remained uncertain. It is true that already in 1872 a plant occurring in Pegu and Tenasserim had been described by Kurz (in Jour. As. Soc. Bengal 41(2): 313) as *Psilobium capillare*, but as the aestivation of its corolla-lobes is contorted, its flowers dioecious, its style provided with two erect hairy arms, and its placentation peltate, this obviously was a mistake; the plant can not even be considered

a near ally. Two years later Kurz himself (in Jour. As. Soc. Bengal **46**: 189. 1874) recognized it as conspecific with the unnamed plants on which Hooker f. had based his genus *Morindopsis*.

In 1925, i.e. more than a century after the publication of Jack's paper, for the first time a plant was referred to *Psilobium*, of which there is no doubt that it fits Jack's generic description. It is a specimen discovered by Ridley among the plants collected by Brooks in Benkulen. Ridley refers to it in the following terms (in Kew Bull. **1925**: 84. 1925):

"*Psilobium nutans* Jack. Lubok Tandai, herb, in shade, common, flowers white green, 6681.

I take this to be the long-lost *Psilobium* of Jack, obtained at Bencoolen. It agrees in almost all points with the description, but the calyx-lobes are described by him as "very large" which though they are fair size, hardly agrees with this."

I have not been able to study this specimen, and the data given by Ridley certainly do not prove that it really belongs to *Psilobium*. The lacking evidence, however, has been supplied by Kerr in the description of his *Ps. siamense* (in Hooker's Ic. Pl. **34**: t. 3332. 1937). This species namely is said to differ from the plant collected by Brooks in the larger size of the flowers, the narrower calyx-lobes, the included sexual organs and the terminal position of the inflorescence, and must be assumed, therefore, to resemble the latter in all other points mentioned in his description. As the fruits of *Ps. siamense* are described as many-seeded, the aestivation of its corolla-lobes as valvate, the stamens as inserted at the base of the corolla-tube, the style as clavate, and the placentas as paired and axial, the set of characters by which the taxonomic position of the genus is determined, must be present in Brook's specimen too.

Although it can, therefore, hardly be doubted that the plant collected by Brooks fits Jack's generic description, it can not be admitted that it is conspecific with *Ps. nutans*, the type-species of Jack's genus. According to Ridley's own remarks it does not fully agree with the description but merely "in almost all points," its calyx-lobes notably not being "very large" but of "fair size" only. Ridley's identification, therefore, can not be accepted. The specimen collected by Brooks probably represents a different, although doubtless nearly related, species.

The taxonomic position of *Ps. siamense* Kerr is clearly indicated by the lengthened internodes, the terminal inflorescence, the halfway united filaments and the large disk, for there is but one other species known so far in which these characters appear. This is *Acranthera tomentosa* R.Br. ex Hook.f., a plant occurring in Assam.

The preceding exposé shows that the genera *Psilobium* Jack and *Acranthera* Arn. ex Meisn. are undoubtedly identical, and as the first dates from 1822, and the latter from 1838, the name *Acranthera* should, according to the priority rule, be rejected in favour of *Psilobium*. This change, however, could hardly be welcomed. In the first place, as neither of the species described by Jack could be rediscovered, there is as yet no type

to which the name *Psilobium* can be attached, and now that the importance of immutable types for the stabilisation of our nomenclature is generally recognized, this will doubtless be felt as a serious drawback. In the second place the change would cause a considerable amount of renaming, for 24 species of *Acranthera* would have to be transferred to *Psilobium*. If, on the other hand, the name *Acranthera* is conserved, but one species, namely *Psilobium siamense* Kerr, has to change its name, for, as stated above, there is very little chance that, for a long time to come, the two species described by Jack will be identified. There is, therefore, in my opinion, sufficient reason for conserving the name *Acranthera*.

In a paper published in 1851 Korthals (in Ned. Kruidk. Arch. 2(2): 183) proposed a new genus *Gonyanera*, which is described as follows:

"Calycis tubus cum ovario connatus, elongatus, subpentagonus; limbus patens, quinquepartitus, partes ovatae acutae. Corollae tubus brevis, limbus 5-partitus, partes aestivatione valvata. Stamina 5, exserta, tubo corollae affixa; filamenta brevia; antherae conniventes, lineares, acutae. Stigma elongato-clavatum; stylus teres, glaber. Ovarium elongatum, angulatum, biloculare. Ovula numerosa, in placentis cylindricis laminae ope dissepimento affixis. Fructus baccatus, bilocularis; semina numerosa, minuta, compressa.

Arbuscula, ramulis teretibus. Folia opposita, longe petiolata, elliptica. Stipulae vaginantes. Flores axillares, bracteati."

In a remark added to the description Korthals declares that his new genus accedes to *Psilobium* in the form of the fruit, but that it differs from the latter in the flower-characters. A comparison of the two generic descriptions, however, fails to bear this out; they agree, in fact, even in minor details. That no mention is made of the genus *Acranthera*, probably finds its explanation in the circumstance that the description of the latter was unknown to him; his paper, namely, although printed in 1851, was written at about the same time at which the latter was published.

Although the description of the flower contains nothing which could stand in the way of an identification of Korthals's genus with *Acranthera*, some doubt might be raised by the description of its habit. It is said to be a small tree provided with terete branches. This is rather inconvenient, for the species of *Acranthera* are all unbranched plants with obtusely quadrangular stems. It is possible, however, that Korthals possessed no field-notes with regard to the habit of the plant, and as several years will have passed between the date of collection (Korthals visited Sumatra, where the plant was collected, in the years 1833–1835) and the date of description, his memory may have deceived him. He may accordingly have mistaken the stem for a branch. It is, of course, not impossible that the latter may have been somewhat more rounded than is usual in this genus, but as his specimens are lost, this supposition can not be verified.

The generic name itself might also offer some difficulty. It would mean (cf. Backer, Verkl. Woordenb. Wet. Plantennamen, Gron. 240. 1937) "pro-

vided with geniculate anthers"; in *Acranthera*, however, the stamens are perfectly straight. To account for this difficulty, I think that the name is misspelt, and that it should be "*Gonianera*": in that case it might be translated as "provided with an angular androecium." As the connective in the Sumatran species of *Acranthera* is strongly keeled, that would be very appropriate.

An entirely different view of the taxonomic position of *Gonyanera* was brought forward by Miquel (in Ann. Mus. Bot. Lugd.-Bat. 4: 262. 1869). He suggested that it might be identical with his own genus *Gardeniopsis* (l.c. 250), but this obviously is a wild shot, for *Gardeniopsis* with its axillary flowers, imbricate aestivation of the corolla-lobes and uni-ovular ovary-cells, clearly belongs to an entirely different circle of affinity. Its position is uncertain; it is even by no means sure that it is a Rubiacea. Miquel says that Blume regarded it as a Rhizophoracea, an opinion which deserves more attention than it has received so far. As our specimens are not provided with flowers, I have not been able to solve this problem.

As the specimens on which the description of *Gonyanera* was based are lost, and as the type-species, *G. glauca* Khs., itself has not been described, there is little hope that the identity of this species will ever be recognized. In the exsertion of the sexual organs it resembles the two species described by Jack and the plant collected by Brooks. In *Acranthera longipes* Merr., the only Sumatran species of which flowers were available to me, I found the sexual organs included.

B. HISTORY OF THE GENUS ACRANTHERA ARN. EX MEISN.

The description of *Acranthera* was sent in January 1838 by Arnott to Meisner, who used it in the compilation of his survey of the Rubiaceae. The latter appeared in the same year in his "Plantarum Vascularum Genera" (1: 162). From a note on the genus *Acranthera* on p. 115 of the second volume, whose successive parts were probably issued simultaneously with the corresponding parts of the first volume, on which they form a running commentary, I infer that the name of the species had already been published as a "nomen nudum" in Wight's "Catalogus." The note reads: "72. (16.) Acranthera. Arnott mss. in litt. d. 30 Jan. 1838. ad nos dat. — Sp. 1: A. Ceylanica, Arn. in Wight cat. n. 2472. — Genus Mussaendae proximum, sed characteribus pluribus et tota facie diversum, ex auct." The number 72 indicates the place assigned to *Acranthera* among the genera belonging to the Rubiaceae; (16.) that among those referred by Meisner to the tribe "Gardeniaceae." The spelling of the specific epithet with a *c* instead of a *z*, as subsequently became customary, deserves our attention, as it evidently has precedence. The remark on the affinity of the new genus with *Mussaenda* L. is noteworthy, because it shows that the idea of a very close relation between these two genera, which up to this moment has never been questioned, originated with Arnott himself. In the following year Arnott's description appeared in the "Annals of Natural

History" (3: 20), and was repeated by Endlicher in his "Genera Plantarum" (p. 1394).

Arnott's description is excellent. Apart from the fact that he mistook the papilliferous upper portion of the style on which the pollen is only temporarily deposited, for the stigma, an error which had also been committed by Jack, and which at that time was comprehensible enough, it contains but a single objectionable statement. This concerns the description of the ovary and fruit. Meisner (Pl. Vasc. Gen. 1: 162) says of the latter that it is "sicut germen pseudo-2-loc., septo medio interrupto utrinque placentam divaricato-2-lamellatam gerente," and the first is described in his own words (in Ann. Nat. Hist. 3: 20. 1839) as "pseudo-biloculare, dissepimentis duobus oppositis, vix ad medium attingentibus, placentam bilamellatam divaricatam ferentibus." Beddome (Ic. Pl. Ind. Or. 1: 5. 1874) and Hooker f. (in Benth. et Hook.f., Gen. Pl. 2: 64. 1873 et Fl. Brit. Ind. 3: 92. 1880) accepted this statement as essentially correct, and described the ovary accordingly as unilocular and the placentation as parietal, but Stapf (in Trans. Linn. Soc. Bot. II, 4: 172. 1894) pointed out that both ovary and fruit are perfectly bilocular. They may, however, easily be mistaken for unilocular, because the dissepiment is rather thin in the middle and, therefore, is easily torn when the razor, with which the sections are made, is not sufficiently sharp.

The Ceylonese plant on which the genus was founded, shows, as Arnott already had noticed, a rather remarkable resemblance, especially in habit but also in the aspect of the fruits, to some species belonging to the Cyrtandreae (Gesneriaceae). This applies also to most of the species which since then have been discovered. As a matter of fact, I myself found two of my new ones (*A. Ruttenii* Brem. and *A. megaphylla* Brem.) among the unnamed species of *Cyrtandra* preserved in the Utrecht and Leiden herbaria, and some of those described by Valeton too had provisionally been referred to that genus. The resemblance, nevertheless, is but superficial, and even without looking at the flowers, the two genera are always easily distinguishable, for the leaves of *Acranthera* are never, like those of *Cyrtandra*, dentate, and they are always surrounded by a thin margin covered with stiff hairs; stipules or their cicatrices are always present in *Acranthera* and in *Cyrtandra* as constantly absent; and the fruits of *Acranthera* are always crowned by the persistent calyx, whereas in those of *Cyrtandra* the calyx, of course, is found at the base.

Up to 1872 the genus remained monotypic, but in that year Kurz (in Jour. As. Soc. Bengal, 41(2): 312) referred to it a Tenasserim plant which had been described by Don (Gen. Syst. 3: 491. 1834) under the name *Mussaenda uniflora* Wall. As it differs from the typical representatives of the genus *Mussaenda* L. in its small size and in the absence of the enlarged calyx-lobes, Kurz transferred it to *Acranthera*, which he regarded, on the authority of Arnott, as a nearly related genus. This transfer was doubtless a change for the worse, for the Tenasserim plant has many more characters in common with *Mussaenda* than with *Acranthera*: its stipules,

exactly as in Mussaenda, are deeply bifid, the flowers show the same form of heterostyly combined with dioecism which is found in that genus, the inside of the corolla-tube is not entirely glabrous but in the upper half covered with the same kind of yellow hairs as that of *Mussaenda*, the stamens are not inserted at the base of the corolla-tube but in or somewhat above the middle, the style ends in two filiform stigmas, and the placentas are peltate. The absence of the enlarged calyx-lobes, of course, can not be adduced as an argument in favour of a near affinity with *Acranthera*, as the latter is certainly not the only genus in which none of the calyx-lobes is enlarged, and as its mode of vegetative propagation by means of stolons is never met with in *Acranthera*, there is no appreciable similarity in habit Hooker f. (Fl. Brit. Ind. 3: 86. 1880) referred this species back to *Mussaenda*, but I could show (in Blumea, Suppl. 1: 118. 1937) that it is conspecific with the type-species of *Aphaenandra* Miq., a genus which deserves to be kept up.

Two years after Kurz's abortive attempt to widen the scope of the genus, the generic isolation of the type-species was definitely broken by the description of two new species by Beddome (Ic. Pl. Ind. Or. 1: 5. 1874). Both had been collected in the Western Ghats. At the same time of all three species figures were given (l.c. t. 23–25), but the details of the latter are, unfortunately, of rather doubtful value.

Hooker f. (Fl. Brit. Ind. 3: 92. 1880) brought the number of species to six, but of the three new ones, *A. tomentosa* R.Br. ex Hook.f. alone may be considered congeneric; the two others, *A. Griffithii* Hook.f. and *A. Maingayi* Hook.f., show the same kind of stipules, the same form of heterostyly combined with dioecism, the same covering with yellow hairs in the upper part of the corolla-tube, the same insertion of the stamens midway in the corolla-tube, the same kind of stigmas and the same form of placentation as the Tenasserim plant which Kurz had referred to this genus, but which Hooker himself had excluded: they belong, like the latter, to the circle of affinity of *Mussaenda*. From the typical representatives of that genus they differ in habit, in the complete absence of the enlarged calyx-lobes, and in the large size and brilliant orange or scarlet colour of the corolla. Stapf (l.c. 173) referred them to a subgenus *Asemanthia*, which Ridley (in Kew Bull. 1939: 600. 1939) rightly raised to generic rank. *Acranthera tomentosa* R.Br. ex Hook.f. (*Androtropis tomentosa* R.Br. in Wall., Cat. n. 8398, nomen), on the other hand, is a true representative of the genus, although apparently no near ally of the species found in Ceylon and in the Indian Peninsula, from which it differs conspicuously in the greater length of the internodes, the larger size of the flowers and the halfway united filaments. The flower-colour and details of the structure of the fruit and seeds are still wanting. A near ally was recently discovered in Peninsular Siam: it is the plant described by Kerr under the name *Psilobium siamense* (see above).

The attitude taken up by Baillon (Hist. Pl. 7: 319, 449. 1880) was logically more consistent than that of Hooker, for recognizing that the

genus *Acranthera* in the latter's delimitation contained species which showed a nearer affinity to *Mussaenda* than to those for which the genus originally was created. He transferred the whole group to *Mussaenda*. The other way out of the difficulty, the purging of the genus of the extraneous elements, however, would have deserved preference. As I will show further on, the true representatives of the genus are by no means nearly related to *Mussaenda*.

Hooker l.c. had already mentioned the presence of species of *Acranthera* in Borneo, but as the genus in his delimitation included *Asemanthia* Ridl., and as both genera have since been found in Borneo, it is impossible to say whether the species he had in mind really belonged to *Acranthera*.

Stapf l.c. was the first to describe a Bornean species, and he too mentions the presence of undescribed Bornean species in the collection of the Kew Herbarium. After pointing out that the ovary of *Acranthera* is always bilocular, he proceeds: "Nevertheless, I think, Acranthera must be retained as a well-marked genus after excluding *A. Maingayi* and *A. Griffithii*. It may be characterized by the herbaceous growth, the generally elongated ovary and fruit, the blue or reddish, upwards widened and funnel-shaped or campanulate corolla and the club-shaped, entire style. It is known from Ceylon, the Tinnevelly and Anamally Hills, the Khasia Hills, Cachar and Manipur, and there are several species, still undescribed, in the Kew Herbarium, from Borneo." Although the really important characters, the absence of hairs on the inside of the corolla, the insertion of the stamens at the latter's base, the way in which the anthers enclose the style and in which they are connected with it by means of the tips of their connectives, the way in which the upper part of the style functions as a temporary depository for the pollen, the subulate or semi-conical, often totally cohering stigmata, and the peculiar structure of the testa with its minutely punctate cells, have all been overlooked. The characters as they are given are not all of them general, for the corolla is by no means always blue or reddish, and the style not always club-shaped, the existence of a difference between *Acranthera* and *Mussaenda* is, nevertheless, clearly indicated. Which species Stapf meant when he said that the corolla might be reddish, is difficult to say. It is possible that the colour was described in this way on the label of one or more of the unnamed Bornean species, for instance on that of the plant afterwards described by Valeton under the name *A. involucrata*. At any rate, the flowers of the Ceylon and Peninsular species are blue, and those of *A. tomentosa* will probably, like those of the related *A. siamensis* (Kerr) Brem. n. comb. (*Psilobium siamense* Kerr), prove to be white or nearly white. The corolla of Stapf's own *A. atropella*, a species collected on the slopes of Mt. Kinabalu, has been described as "obscure cyanea." However, as the flowers of the Bornean species, which since then have come to light, are all either white, yellow, orange or red, I suppose that with regard to the flower-colour of *A. atropella* some error has been committed; maybe they assume a dark hue in drying.

In 1910 and 1912 Valeton (in Bot. Jahrb. 44: 550. 1910 et op. cit. 48: 111. 1912) described three more species from Borneo, of which one, *A. axilliflora*, is said to be provided with axillary flowers. Further on I will show that these flowers are in reality uniflorous inflorescences, and that the latter are not really axillary but borne on axillary brachyblasts provided with a pair of rudimentary leaves. All the same this plant represents a type which is quite distinct from that of the other species which up to that time had been recognized as belonging to this genus. In fact, it would probably have been more consistent if Valeton had referred it to *Psilobium*. The *Acranthera* species, which at that time were known, produce their inflorescences at the end of the stem. Later these inflorescences are forced into a lateral position by the development of the bud which forms the continuation of the stem. It is rather remarkable that the same two structural types occur side by side in another genus belonging to the Rubiaceae, namely in *Pomazota* Ridl., where some of the species are provided with sympodial stems and inflorescences which are at first terminal and afterwards solitary at the nodes, whereas in other species the stems are monopodial with the inflorescences opposite at the nodes, while a pair of scale-like leaves at the base of the peduncle prove that they are in reality borne on axillary brachyblasts. As stated above, it is inflorescences of this kind that are found in the Sumatran group of species of *Acranthera* to which, most probably, Jack's *Psilobium nutans* and *Ps. tomentosum* and Korthals's *Gonyanera glauca* too should be referred.

The next year Merrill described a species from the Philippines, which so far has remained the only representative of the genus occurring east of Borneo. *Acranthera philippinensis* Merr. appears to be confined to the western part of Mindanao, i.e. to that part which by means of the Sulu Islands is connected with North Borneo. In this respect it is noteworthy that it differs in minor points only from some of the Bornean species.

At about the same time Valeton described and figured in the "Icones Bogorienses" (4: 181. t. 355, 356. 1913; 4: 275. t. 391–399. 1914) a fairly considerable number of new Bornean species. The last plate figures a species described under the name *A. strigosa*, which differs from the others in the shape of the stipules and in the flower-structure. The stipules are united in a fringed sheath, and the style is longer than the stamens and, if the figure is to be trusted, not provided with an apparatus serving as a temporary depository for the pollen. It seems, therefore, better to exclude this species. The form of the stipules suggests affinity with *Polysolenia* Hook.f., but as neither of Valeton's nor Hooker's species-material was available to me, I am unable to express a definite opinion. *Acranthera multiflora* Val. (l.c. 255, t. 396) is probably identical with *A. frutescens* Val. (in Bot. Jahrb. 44: 551. 1910), at least the descriptions of the two species do not reveal differences of any importance.

In 1934, Merrill described two apparently nearly related species from Sumatra. As no flowers were present, the descriptions are not entirely satisfactory. Of one of them, however, flowers have subsequently been

collected, so that its position could definitely be ascertained. The relations between these plants and Jack's species of *Psilobium* and *Gonyanera glauca* Khs. have already been discussed.

Three years later Merrill (in Mitt. Inst. Allg. Bot. Hamburg 7: 284. 1937) reverted once more to this genus, describing four new species from Southwest Borneo. One of these proved to be provided with red, another with orange-red flowers.

The preceding notes show that twenty-five of the species which up to now have been referred to *Acranthera*, may confidently be regarded as true representatives of this genus, but as two of them, *A. frutescens* Val. and *A. multiflora* Val., are probably conspecific, only twenty-four are here admitted. To this number should be added the plant described by Kerr under the name *Psilobium siamense*, the species on which the genera *Psilobium* Jack and *Gonyanera* Khs. were based, but which, on account of the insufficiently detailed descriptions, are now unidentifiable, and further the ten species described below.

The specimens which I could study, belong almost all to the following four institutes: the "Rijksherbarium" at Leiden, the University Herbarium at Utrecht, the "Arnold Arboretum" and the "Institut für allgemeine Botanik, Hamburg." As I have seen but a small part of the Buitenzorg material and nothing at all from the collections of the Kew Herbarium and of the Sarawak Museum, my survey does not claim to be exhaustive.

In the descriptive part of this paper special attention has been paid to the species occurring in the Malay Archipelago, all those of which material was available, being fully described. No exception has been made for species of which good descriptions were already extant, because the descriptions in a monograph should, in my opinion, all be made after the same pattern; this is the only way to ensure an easy comparability.

THE TAXONOMIC POSITION OF THE GENUS

In the "Introduction" to this paper I have already pointed out that Arnott's assumption of a very close affinity between *Acranthera* and *Mussaenda* has up to now never been questioned. In Baillon's mind this belief had grown to such a firm conviction that he thought that the two genera might better be united. The common characters on which this assumption rests, are: the pluri-ovular ovary-cells, the valvate aestivation of the corolla-lobes, the fleshy pericarp, the axile placentas, the reddish brown seeds, and the terminal position and, at least partly, cymose structure of the inflorescence.

The bulk of the genera now referred to the tribes Hedyotideae and Mussaendeae are provided with pluri-ovular ovary-cells, show a valvate aestivation of the corolla-lobes, and have axile or nearly axile, peltate or subpeltate placentas and ovoid or angular, yellowish, reddish or brown, more or less distinctly alveolate, striate or punctate seeds. As the distinction between these two tribes rests on the entirely artificial antithesis:

fruits dry or fruits fleshy, I have argued in my paper "On Urophyllum Wall. (Rubiaceae) and its nearest allies" (in Rec. d. trav. bot. Néerl. 38: 171. 1940) that it would be advisable to unite them, under the proviso, however, that those genera in which one or more of the characters enumerated above are missing, should be excluded. As instances of such genera I referred to those provided with a clavate or columnar placenta and smooth seeds. In my recently published (Jour. Arnold Arb. 28: 186–203. 1947) "Monograph of the genus Pomazota Ridl." I give a short survey of the genera which for some reason or other should be excluded. *Acranthera* is not mentioned in this list, because its aberrant character is not so strongly marked as in the others. It is all the same by no means insignificant: its placentas, namely, are not peltate or subpeltate, but attached along their whole length to the dissepiment. It is, therefore, extremely questionable whether this genus may be reckoned to this circle of affinity. If it should be excluded, it can, of course, not be considered a near ally of *Mussaenda*, which is a quite typical representative. The other points of resemblance between *Acranthera* and *Mussaenda*, the fleshy fruits, the terminal position and, at least partially, cymose structure of the inflorescences, do not belong to the general characters of this large tribe, and as they appear in almost all the larger groups, are of little importance. The resemblance between the two genera, therefore, is not sufficiently comprehensive to be regarded as proof of their near affinity.

A survey of the points of difference between the two genera may be expected to throw more light on this question. The principal ones are found in: the structure of the stipules, the floral mechanism, the presence or absence of hairs on the inside of the corolla-tube, the insertion of the stamens, the relation between the latter and the style, the nature of the stigmata, the attachment of the placentas and the structure of the testa. In *Acranthera* the stipules are simple; the flowers homostylous and hermaphrodite; the corolla is completely glabrous inside; the stamens are inserted at the base of the tube; the anthers form a sheath around the style, and are connected by means of the projecting tips of the connectives with the top of the latter; the pollen is temporarily deposited on the upper part of the style, which, to that end, is covered by rows of papillae (for the sake of convenience this part of the style will from now on be designated as the "receptaculum pollinis"): from here it is removed by the visiting insects; the stigmata are subulate or semi-conical, and do not spread, not rarely remaining permanently attached to each other; the placentas, as stated above, are attached along their whole length to the dissepiment, and the testa-cells are minutely but very densely pitted (Fig. 1). In *Mussaenda*, on the other hand, the stipules are always bifid or bipartite; the flowers heterostylous, the short-styled ones being male and the long-styled ones female; the upper part of the corolla-tube is inside covered with yellow hairs; the stamens are inserted at or somewhat above the middle of the tube; there is no connection whatever between the anthers and the style, and the pollen is directly removed from the anthers to the stigmata;

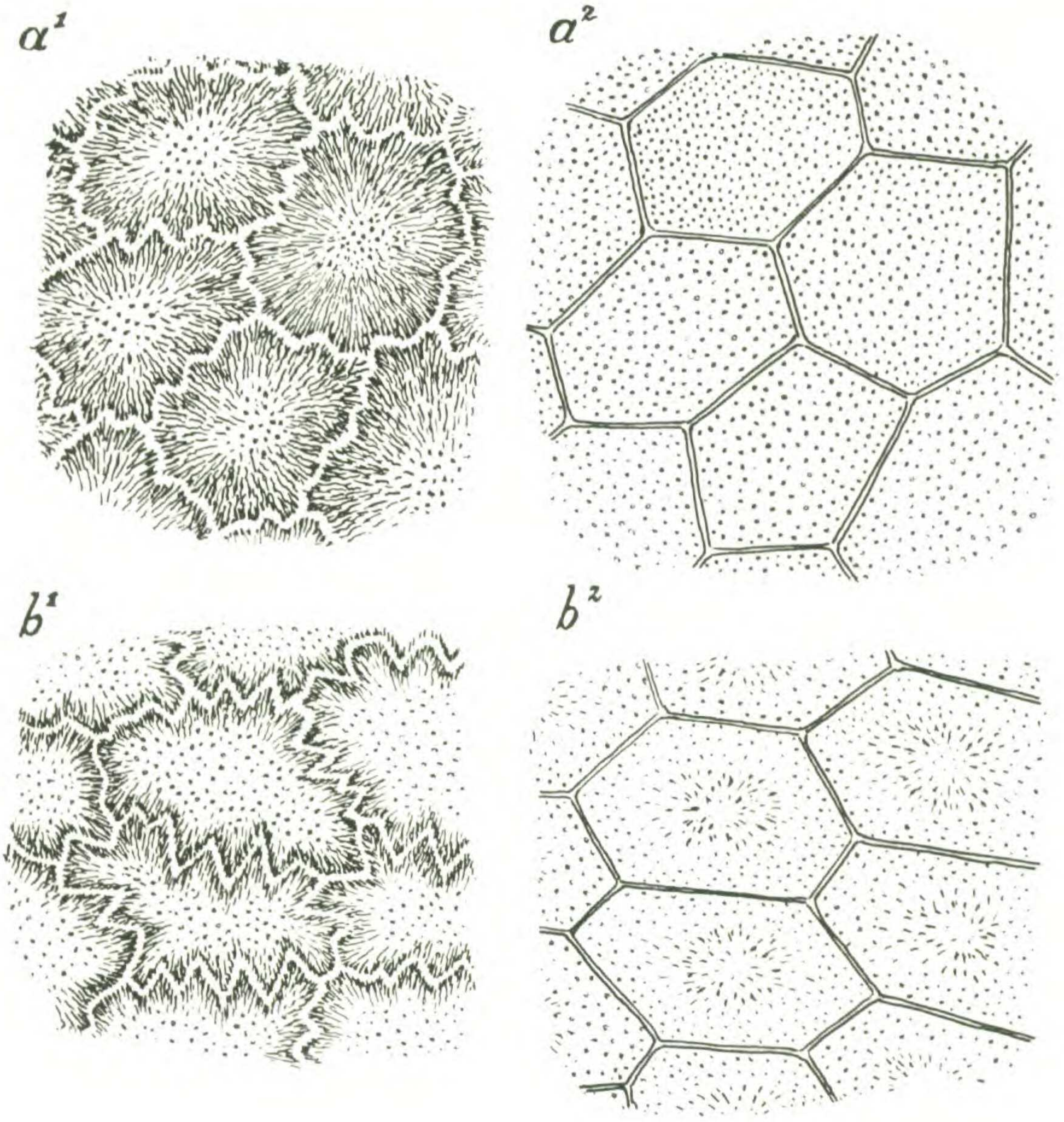

FIG. 1. Testa-cells of *Acranthera longipes* Merr. (a) and *A. siliquosa* Brem. (b). The cells consist almost entirely of the strongly thickened bottom-wall, which in (a) has the shape of a plano-concave, in (b) of a plano-convex lens; (a^1) and (b^1) show the deeper layers, in which the peripheral pit-canals converge towards the centre; (a^2) and (b^2) a surface view of the same cells; in (b^2) the pit-canals in the central boss are seen to diverge a little.

the latter are, at least in the female flowers, always linear and spreading; the placentas are peltate, and the testa-cells provided with a few very large pits (Fig. 2).

These differences are, of course, not all equally important. The value of the difference in the attachment of the placentas to the dissepiment, has already been discussed; it certainly justifies some doubt with regard to the propriety of leaving the genus *Acranthera* in this tribe. The peculiar

kind of floral mechanism is an even more weighty argument against the view that it should belong to this group, for in none of the general related either to *Hedyotis* L., *Urophyllum* Wall., *Sabicea* Aubl. or *Mussaenda* L., a style functioning as a temporary depository for the pollen is found. As I have pointed out in my "Monograph of the genus Pavetta L." (in Fedde's Repert. 38: 11. 1934) a style of this nature characterizes one of the main

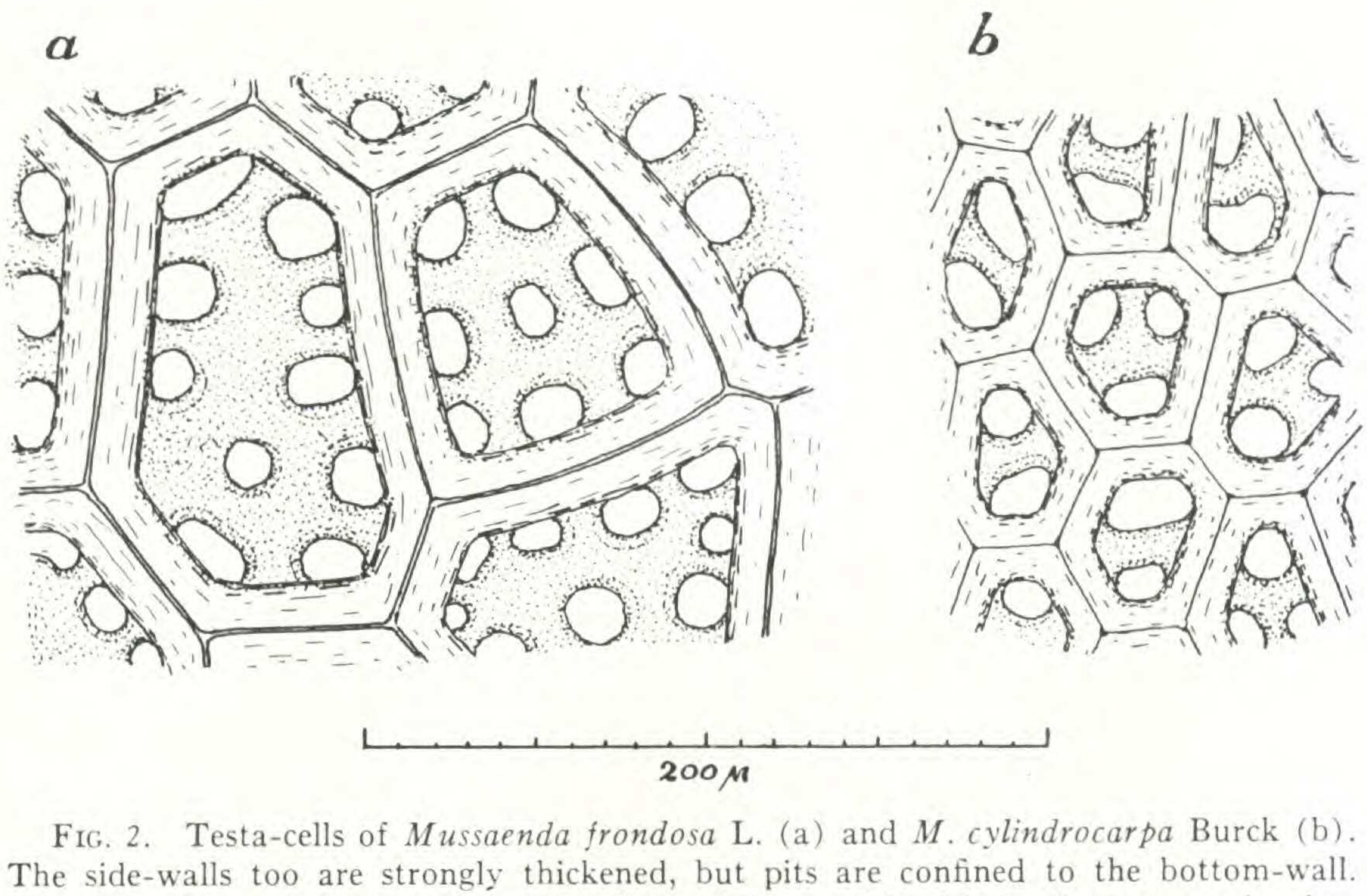

FIG. 2. Testa-cells of *Mussaenda frondosa* L. (a) and *M. cylindrocarpa* Burck (b). The side-walls too are strongly thickened, but pits are confined to the bottom-wall. The size of the cells and the number of pits differ considerably in the two species, but the pits themselves vary but little.

groups of the family, comprising the tribes Ixoreae, Gardenieae, Alberteae. Vanguerieae, the isolated genera *Crossopteryx* Fenzl and *Coptosapelta* Khs., and perhaps part of the present tribe Naucleae. In all these plants. however, the anthers wither after the pollen has been deposited on the style, whereas the *receptaculum pollinis* of *Acranthera* remains included between the empty anthers, and can be reached only through the windows between the projecting tips of the connectives. For this reason, and also because the stamens are not, as in the Ixoreae and their allies, inserted in the corolla-throat, but at the base of the tube, it seems to me that *Acranthera* can not be related to this group either. Moreover, the connection of the stamens by means of the projecting tips of the connectives with the top of the style is a feature so entirely unparalleled in the Rubiaceae, that one might feel inclined to regard the position of the genus with regard to the rest of the family, as similar to that of the Asclepiadaceae with regard to the Apocynaceae, although in this way the importance of the connection between the anthers and the style, is doubtless over-emphasized. It is perhaps more readily comparable to the way in which in the genera *Ceropegia* L. and *Dichaelia* Harv. (Asclepiadaceae) the corolla-tips cohere.

There is one point more on which I should like to expatiate a little, although it does not concern a difference between *Acranthera* and *Mussaenda*, for in the point I mean, the absence of raphide-cells, there is complete agreement between the two genera.

With regard to the presence or absence of raphide-cells there is no conformity between the various groups included in my enlarged tribe Hedyotideae, and as all other large groups are in this respect entirely consistent, this is doubtless a weak point. It might be argued that *Hedyotis* L. and its nearest allies, which are all provided with raphide-cells, are perhaps more closely related to the Spermacoceae and Psychotrieae, which they resemble in the aestivation of the corolla-lobes, but from which they differ in the pluri-ovular ovary-cells, than to *Sabicea* Aubl., *Urophyllum* Wall. and *Mussaenda* L. and their respective allies, which they resemble, apart from the aestivation of the corolla-lobes, to some extent in the nature of the placentation, but in which raphides are apparently always wanting. A satisfactory solution of this question can not yet be given. For the determination of the position to be assigned to *Acranthera*, this is not of paramount importance, as the relations between this genus and the various groups in which raphides are wanting, are hardly more pronounced than those with *Hedyotis*.

THE SUBDIVISION OF THE GENUS

Up to now no attempt has been made to arrange the species of *Acranthera* in natural groups. Valeton, who at one time (in Ic. Bog. 4: fasc. 4. 1914) described no less than nine new species, contented himself with an alphabetical arrangement! This apparently means that he had not been able to distinguish well-defined groups, and was of opinion that the best way to make the species distinguishable, was to figure them, which he accordingly did with as many as he could lay hands on. The result is that of no other rubiaceous genus of any extent has such a large percentage of the species been figured (of the 20 species known in 1914 e.g. no less than 14, i.e. 70 per cent). These efforts, however, were, I am afraid, of little avail, for even with the aid of the pictures the species are by no means easily recognizable. It was to be expected, therefore, that a more thorough analysis would lead to better results. On account of the fact that not all species were available, and also because on some points, for instance on the habit and on the flower-colour, reliable information could not always be obtained, the results are not yet fully satisfactory; but I have no doubt that as soon as more material is forthcoming, the defects of my classification will easily be amended.

It is here perhaps the most suitable place to make a few remarks on the two points just mentioned, the habit and the flower-colour.

A good deal of misapprehension has existed up to now with regard to the habit of these plants. On the labels they are not rarely described as shrubs and in one case even as a small tree (*A. longipes* Merr.), but these

indications should not be taken at their face value. It is a well-known fact that European collectors, accustomed to the soft shoots of the herbs of their native countries, often take tropical herbs for shrubs, even though there is no sign of branching, because they are misled by the woodiness of the stems. The indication "small tree" on the label of some of the specimens of *A. longipes* Merr., on the other hand, is doubtless a faulty translation of the "pohon ketjil" of the Malay collector. It is often overlooked that in Malay each plant provided with an erect stem is called "pohon," no matter whether it is an herb a few centimeters high and without a singe branch or a tree with a large crown.

Stapf was doubtless right when he described the habit of the *Acranthera* species as herbaceous. Among all the specimens investigated by me, but very few were branched, and in these few exceptions the ramification was always of the pseudo-dichotomous kind. They belong to species in which the stems normally are sympodial. This means that occasionally at the base of the inflorescence instead of one bud both buds develop. Even those species which, like *A. frutescens* Val., reach a fairly considerable height (1.5–2 m.), apparently remain unbranched. It is not impossible that the larger plants require more time to complete their life-cycle than those that remain lower, but no reliable information with regard to this point seems to be available. In some species there are indications that the stems in the end sink down, and that innovations are produced from their basal parts.

Our information with regard to the flower-colour too is far from complete. This is all the more unfortunate as it looks as if this might be of real taxonomic importance.

The three western species are blue-flowered. The flower-colour is unknown to me, of the Assam *A. tomentosa* R.Br. ex Hook.f. but in the nearly related *A. siamensis* (Kerr) Brem. the flowers are white. The first of the species described from Borneo, *A. atropella* Stapf, was said to be provided with a dark blue corolla, but, as stated above, this is probably a mistake. The majority of the Bornean species and the only Philippine one possess white or slightly tinted flowers; in the rest of the Bornean species the corolla is yellow, orange or red. In these plants the calyx too is often coloured, not rarely in a different shade. With regard to the flower-colour of the Sumatran species we are insufficiently informed, but those of Brooks's Benkulen species, the one that was identified by Ridley as *Psilobium nutans* Jack, are stated to be greenish white.

The characters with which we will mainly have to be content, are: the shape and size of the stipules, the position and form of the inflorescences, the shape of the corolla-tube, the fusion or complete freedom of the basal parts of the stamens, the presence or absence of a fringe of cilia between the outer rim of the thecae and the connective, the shape of the latter, the presence or absence of a disk, the form of the *receptaculum pollinis*, the structure of the fruit and that of the testa. By the aid of these characters I have divided the genus in nine subgenera, of which the first,

Eu-acranthera, is confined to Ceylon and the Indian Peninsula, the second, *Androtropis*, to Assam and Peninsular Siam, the fourth, *Amphoterosanthus*, to Sumatra, and the others to Borneo, except the eighth, *Mitracme*, which contains, besides some Bornean species, the only representative of the genus found in the Philippines.

Eu-acranthera and *Androtropis* differ from all the other subgenera by the presence of a well-developed disk. In *Eu-acranthera*, moreover, the corolla is blue and its tube begins with a cylindrical part, which widens in the upper half to funnel-shape, whereas in the other subgenera the corolla is presumably never blue, and its tube is either entirely funnel-shaped or, more often, narrowly campanulate. *Androtropis* differs from the other subgenera in the presence of a staminal tube formed by the basal halves of the filaments; in all other subgenera the filaments are entirely free.

The third subgenus, *Cleomocarpus*, differs from the other subgenera in the structure of the fruits, which are narrowly cylindrical and marginate, the hardened margin remaining after the seeds have been shed, in the form of a "replum." The latter, however, is morphologically not equivalent to the replum of the herbaceous Capparidaceae, the Cruciferae and *Chelidonium*, for in these plants the rim is formed by the fused margins of the carpels, whereas in the subgenus *Cleomocarpus* of the genus *Acranthera* it represents the midribs of the carpels. The dissepiment, accordingly, is not, as in the Cruciferae, attached to the rim, but stands at right angles with it; in the end the dissepiment disappears with the valves. The stipules of *Cleomocarpus* are smaller than those found in any other subgenus; in shape, however, they are not unlike those of the subgenera *Eu-acranthera*, *Androtropis* and *Amphoterosanthus*. Its two species are nearly glabrous plants with densely reticulated leaves.

The fourth subgenus, *Amphoterosanthus*, is confined to Sumatra and the neighbouring island Simalur. It resembles the three preceding subgenera in the triangular shape of the stipules, but differs from them in the position of the inflorescences, which are borne on opposite brachyblasts provided with a pair of rudimentary leaves. The inflorescences themselves are few-flowered. In position and structure they are similar to those found in some species belonging to the subgenus *Dichroanthes* and to those of *Ablepharidesma*. The seeds are reticulate, whereas in almost all other species of which ripe fruits were available, the seeds were found to be either distinctly carunculate or nearly smooth. There is, however, no difference of fundamental importance between the various kinds of seed. The two species of *Psilobium*, described by Jack, and *Gonyanera glauca* Khs. belong probably to this subgenus. As no specimens are extant, and as the plants are not identifiable from the descriptions, it did not seem advisable to retain either of these names for the denomination of the subgenus.

In the other subgenera the stipules are wider and longer than in the preceding ones, and of an entirely different shape, namely ovate, elliptic or oblong. The differences between these subgenera are not so striking as

those between the former. They are mainly confined to the position and structure of the inflorescence, the shape of the *receptaculum pollinis* and the presence or absence of a fringe of cilia between the thecae and the connective. *Athroophleps*, however, is well characterized by the peculiar nature of the reticulation. It is noteworthy that with regard to the shape of the *receptaculum pollinis* and to the presence or absence of a fringe of cilia along the connective, the first four subgenera, *Eu-acranthera*. *Androtropis*, *Cleomocarpus* and *Amphoterosanthus*, show a uniform character: their anthers are always eciliolate, and the *receptaculum pollinis* is everywhere fusiform, and of about the same length as the thecae.

In the three subgenera *Phanerochiton*, *Dichroanthes* and *Ablepharidesma* too the *receptaculum pollinis* is of about the same length as the thecae. and either fusiform or cylindrical. In *Phanerochiton* and *Dichroanthes* the anthers are ciliolate, in *Ablepharidesma* eciliolate. The monotypic subgenus *Phanerochiton* differs from the two others in the long, scarious stipules, the trichotomous inflorescence with its large bracts and the thick-walled fruit, and from all other representatives of the genus in the presence of dark-coloured resin-cells on the upper side of the leaves. In *Dichroanthes* the filaments are about as long as the anthers, the *receptaculum pollinis* cylindrical, and the flowers often, perhaps even always. gaily coloured, the corolla yellow, orange or red, and the calyx white or in a different shade of orange or red. In the other Bornean species the filaments are always much shorter than the anthers, and the corolla is apparently everywhere either white or but slightly tinted. *Dichroanthes* is divided in two series, one with terminal inflorescences and cohering stigmata, the other with inflorescences borne on opposite brachyblasts and with free stigmata. In *Ablepharidesma* the inflorescences are few-flowered and borne on opposite brachyblasts, the anthers eciliolate, the shoots thin. and the leaves and stipules small.

In the subgenus *Mitracme* the *receptaculum pollinis* is much shorter than the thecae and mitriform, i.e. the papillae are reclinate and increase from the top towards the base of the receptaculum gradually in length. In this subgenus I distinguish four series. In the first series the anthers are ciliolate, whereas in the other three they are always eciliolate; the species belonging to this series are robust plants with large trichotomous inflorescences provided with large bracts. The second series is monotypic, the only species being the Philippine *A. philippinensis* Merr.; it is a low plant with a trichotomous inflorescence provided with well-developed bracts. The third series is also monotypic, the only species being a narrow-leaved plant with few-flowered inflorescence and small bracts. The fourth series comprises plants with umbelliform inflorescence, in habit not unlike some of the species belonging to the subgenus *Dichroanthes*.

The last subgenus, *Athroophleps*, is a small but very natural group. confined to North Borneo and easily recognizable by the peculiar arrangement of the thick-set prominulous venules, which form narrow meshes,

stretched in a transverse direction. In *A. capitata* Val. this curious arrangement was noticed already by Valeton (cf. Ic. Bog. 4: 276 (line 6), t. 391, fig. 12. 1914). In none of the other subgenera are the meshes stretched in this direction, and except in *Cleomocarpus*, where the reticulation, however, is very faint, their number is always much smaller. Other peculiarities of this subgenus are the annular shape of the *receptaculum pollinis* and the great length of the points in which the connectives are drawn out.

DESCRIPTIO GENERIS*

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Herbae plerumque simplices, rarius pseudo-dichotome ramificatae, subrosulares, ascendentes vel suberectae, basi lignescentes. Caulis plerumque sympodialis, obtuse quadrangularis, internodiis bisulcatis. Folia opposita et aequalia, petiolata; lamina plerumque oblanceolata vel obovata, apice acuminata, margine anguste membranacea ciliata, substrigosa vel strigosa, facie ventrali sub lente albido-granulata, costa nervisque subtus plerumque pilosis, raphidibus et acaridomatiis nullis. Stipulae interpetiolares, simplices, extus haud raro colletris subulatis sparsae, intus glabrae. In-

* The abbreviations for the herbaria of the institutions cited in this paper are as follows: AA=Arnold Arboretum; BD=Bot. Mus., Berlin-Dahlem; BZ=Buitenzorg Botanic Garden; HGB=Inst. Allg. Bot., Hamburg; L=Rijksherbarium, Leiden; U=Bot. Mus., Utrecht.

florescentiae plerumque apice caulis evolutae, casu quo a ramulo axillari mox in positionem lateralem coactae, rarius ramulos abbreviatos (brachyblastos) oppositos, foliis duobus rudimentariis instructos terminantes; flores paniculati, cymosi vel cymoso-umbellati, rarius solitarii, pedicellati vel subsessiles; bracteae variae. Flores hermaphroditi, plerumque 5-, raro 4-meri, aliqui interdum 6-meri. Ovarium plerumque elongatum, rarius turbinatum, biloculare, dissepimento plerumque tenui et faciliter discindente; placentae utroque loculo duae, prope axem orientes et ei parallelae, rarius confluentes, per totam longitudinem dissepimento affixae; ovula numerosissima. Calyx usque ad basin partitus, corollae tubo plerumque subaequilongus; lobi haud raro paulum inaequilati; glandulae interlobulares plerumque conspicuae. Corolla colore variabili, extus plerumque pilosa, intus semper glaberrima; tubus nunc e basi cylindrica infundibuliformis, nunc totus infundibuliformis vel anguste campanulatus; lobi patentes, aestivatione reduplicato-valvata. Stamina basi corollae inserta, tubo plerumque inclusa, rarius breviter exserta; filamenta glabra vel rarius papillosa, plerumque libera, raro usque ad medium connata; antherae lineares, conjuncte stylum includentes, introrsae, thecis facie ventrali contiguis, connectivo faciem dorsalem totam complente, haud raro gibboso vel carinato, margine interdum ciliolato, apice in apiculam vel aristam apici styli incumbentem et cum eo cohaerentem producto. Discus nunc breviter cylindricus vel semi-globosus, nunc inconspicuus. Stylus staminibus aequilongus, parte superiore papillis plerumque 10-seriatim dispositis obtecta pro receptaculo pollinis agente, apice in stigmata subulata vel semi-conica parallela vel confluentes exeuns. Fructus ovoideus, turbinatus vel cylindricus, plerumque baccatus, raro plus minusve capsularis, semper calyce coronatus. Semina parva et numerosissima, rubro-brunnea vel subnigra, paulum compressa, carunculata vel reticulata, testae cellulis semper densissime punctatis, albumine carnoso, embryone recto et parvo.

Distributum speciebus adhuc certe notis 35 in umbra nemorum Ceylaniae, Peninsulae Indicae, Assamiae, Siamiae Peninsularis, Sumatrae, terrae Borneënsis, insulae Filippinae Mindanao dictae.

Species typica: *A. ceylanica* Arn. ex Meisn.

KEY TO THE SUBGENERA

Disk shortly cylindrical or semi-globose. Inflorescences always at the end of the stem. — Species from Ceylon, the Western Ghats, Assam and Peninsular Siam.

Corolla blue; basal part of the tube cylindrical, upper part infundibuliform. Filaments free. — Species from Ceylon and the Western Ghats...A. *Eu-acranthera*

Corolla (always?) greenish; tube entirely infundibuliform. Filaments in the lower half connate. — Species from Assam and Peninsular Siam...B. *Androtropis*

Disk inconspicuous. Inflorescences either at the end of the stem or borne on opposite brachyblasts provided with two rudimentary leaves. — Species from the Malay Archipelago (Sumatra, Borneo, Mindanao).

Stipules triangular, at the most 1.5 cm. long, usually much shorter.

Stipules not more than 3 mm. long. Inflorescences at the end of the stem. Fruits bicostate; the ribs after the shedding of the seeds remaining behind in the form of a replum. Seeds carunculate. — Bornean species.....C. *Cleomocarpus*

Stipules 7–15 mm. long. Inflorescences at the end of opposite brachyblasts provided with rudimentary leaves, few-flowered. Fruits 5- or 6-costate. Seeds reticulate. — Species from Sumatra and Simalur...D. *Amphoterosanthus*

Stipules ovate, elliptic or oblong, usually more than 1.5 cm. long, if somewhat shorter (e.g. subgenus *Ablepharidesma*), then at least with the greatest width near the middle and several times longer than the diameter of the stem.

Receptaculum pollinis as long as or but slightly shorter than the thecae, and either cylindrical or fusiform.

Connective ciliolate.

Leaves on the upper side dotted with dark-coloured resin-cells. Inflorescences either trichotomous with fairly long primary branchlets or, by the suppression of the lateral branchlets, long-pedunculate. Bracts large. Corolla reddish. — A single Bornean species.....E. *Phanerochiton*

Inflorescences either umbelliform or reduced to a single flower, always subsessile. Bracts small. Corolla yellow, orange or red. — Bornean species.....F. *Dichroanthes*

Connective eciliolate. Inflorescences borne on opposite brachyblasts provided with rudimentary leaves, few-flowered. Corolla white. — Bornean species.....G. *Ablepharidesma*

Receptaculum pollinis much shorter than the thecae, either mitriform or annular. Inflorescences always at the end of the stem.

Reticulation lax; the smaller venules not or but slightly prominent. *Receptaculum pollinis* mitriform. — Species from Borneo and Mindanao.....H. *Mitracme*

Meshes of the reticulation small and stretched in a transverse direction; the venules themselves prominulous. *Receptaculum pollinis* annular. — Confined to North Borneo.....I. *Athroophleps*

SUBGENUS A. EU-ACRANTHERA BREM. SUBGEN. NOV.

Herbae humiles, caule petiolisque pilosis. Folia laxe reticulata. Stipulae ovato-triangulares, internodiis breviores. Inflorescentia terminalis, trichotome corymbosa. Corolla coerulea vel violacea, tubo e basi cylindrica infundibuliformi, quam calyce multo longiore. Stamina filamentis papillosis, liberis, quam antheris longioribus, antheris eciliolatis. Discus breviter cylindricus. Receptaculum pollinis fusiforme. Fructus ovoideus. Semina carunculata.

Species tres, Ceylaniam et Peninsulam Indicam habitantes, ubi in altitudine 900–1500 m. crescunt. Subgeneris typus: *A. ceylanica* Arn. ex Meisn.

KEY TO THE SPECIES

Calyx-lobes obovate, spreading; anthers shortly apiculate. — Indian Peninsula.....1. *A. anamallica*

Calyx-lobes linear-lanceolate or narrowly triangular, erect; anthers aristate.

Leaves subglabrous on the upper side; calyx-lobes linear-lanceolate; corolla-tube 4 cm. long. — Indian Peninsula.....2. *A. grandiflora*

Leaves distinctly hairy on the upper side; calyx-lobes narrowly triangular; corolla-tube 2 cm. long. — Ceylon.....3. *A. ceylanica*

1. **Acranthera anamallica** Bedd., Ic. Pl. Ind. Or. 1: 5, t. 23. 1874; Hook.f., Fl. Brit. Ind. 3: 93. 1880; Gamble, Fl. Pres. Madras 2: 611. 1921. — Indian Peninsula (Western Ghats).

2. **Acranthera grandiflora** Bedd., Ic. Pl. Ind. Or. 1: 5, t. 25. 1874; Hook.f., Fl. Brit. Ind. 3: 93. 1880; Gamble, Fl. Pres. Madras 2: 611. 1921. — Indian Peninsula (Western Ghats).

3. **Acranthera ceylanica** Arn. ex Meisn., Pl. Vasc. Gen. 2: 115. 1838.
Acranthera zeylanica Arn. in Ann. Nat. Hist. 3: 21. 1839; Walpers, Repert. 6: 77. 1846; Thwaites, Enum. Pl. Zeyl. 138. 1860; Bedd., Ic. Pl. Ind. Or. 1: 5, t. 24. 1874; Hook.f., Fl. Brit. Ind. 3: 92. 1880; Trimen, Handb. Fl. of Ceylon 2: 324. 1894. — Ceylon.

As no material of *A. anamallica* and of *A. grandiflora* was available to me, the key was based on data gathered from the literature.

SUBGENUS B. ANDROTROPIS (R.Br. in Wall. Cat. n. 8398, gen. inedit.)

Herbae altiores. Folia laxe reticulata. Stipulae ovato-triangulares, internodiis multo breviores. Inflorescentia terminalis, corymbosa. Corolla ubi color notus viridula, tubo infundibuliformi, quam calyce longiore. Stamina filamentis glabris, usque ad medium connatis, quam antheris longioribus, antheris eciliolatis. Discus breviter cylindricus vel semiglobosus. Receptaculum pollinis fusiforme. Fructus cylindricus, 5-costatus. Semina carunculata.

Species duae, Assamiam et Siamiam Peninsularem habitantes. Subgeneris typus: *A. tomentosa* R.Br. ex Hook.f.

KEY TO THE SPECIES

Leaves strigose on the upper side. Corolla more than 3 cm. long. — Assam.....4. *A. tomentosa*
Leaves glabrous on the upper side or near the margin and towards the base strigose. Corolla about 2 cm. long. — Peninsular Siam.....5. *A. siamensis*

4. **Acranthera tomentosa** R.Br. ex Hook.f., Fl. Brit. Ind. 3: 92. 1880 (*Androtropis tomentosa* R.Br. in Wall. Cat. n. 8398, nomen). — Assam.

5. **Acranthera siamensis** (Kerr) Brem. n. comb.
Psilobium siamense Kerr in Hook., Ic. Pl. t. 3332, 1937. — Peninsular Siam.

Of *A. tomentosa* I had but a single, not very good, specimen, whose flowers were much larger than those of the specimens described by Hooker. Fruits of this species were not available to me.

For *A. siamensis* I relied on the detailed description given by Kerr and on the excellent plate by which the latter is accompanied. Kerr referred this species to *Psilobium* Jack, because it resembles the specimen collected by Brooks in Benkulen, which Ridley (in Kew Bull. 1925: 84. 1925) had identified as *Ps. nutans* Jack, but which is probably a different species (see above). The near affinity between the Siamese plant and *A. tomentosa* R.Br. ex Hook.f. was overlooked by the author.

Kerr ends his description with the following remark: "It seems probable, judging from a cursory examination, that some plants assigned to *Gardenia*, Section *Gardeniella*, should rather be referred to *Psilobium*."

The section *Gardeniella* was created by Ridley (Fl. Mal. Pen. 2: 80. 1923), who referred to it four species from the Malay Peninsula, which show but little resemblance to the typical representatives of the genus *Gardenia*. The possibility that they might belong to *Acranthera*, of which representatives are found both to the North and to the South of the Malay Peninsula, certainly deserves our attention. Judging from the somewhat

meagre descriptions, I do not believe however that anyone of them can be transferred to this genus. The first, *G. tentaculata* Hook.f. is described by Ridley as a "bush," a habit which is entirely unknown in *Acranthera;* its stipules, apparently, are similar to those of *A. strigosa* Val., a species which in my opinion does not belong to this genus. The three other ones seem to be unbranched, but they differ from all species of *Acranthera* known so far in the position of the inflorescences: the latter, namely, are found on the defoliated part of the stem. In two of them, *G. virescens* Ridl. and *G. pulchella* Ridl., the stipules, moreover, are like those of *G. tentaculata* "fringed with long points." The last one, *G. didymocarpus* Ridl., had provisionally been referred by H. H. W. Pearson to *Acranthera.* Its removal by Ridley to *Gardenia* evidently means that it does not fit the description of *Acranthera.* It is possible, however, that Ridley was influenced by the lateral position of the inflorescences.

SUBGENUS C. CLEOMOCARPUS BREM. SUBGEN. NOV.

Herbae ascendentes vel suberectae, subglabrae. Folia dense sed vix conspicue reticulata. Stipulae breviter et late triangulares, in cupulam brevem connatae, apiculatae, usque ad 3 mm. altae, persistentes. Inflorescentia terminalis. Corolla alba, extus glabra, tubo campanulato. Stamina filamentis glabris et liberis, quam antheris multo brevioribus, antheris connectivo carinato, eciliolato. Discus inconspicuus. Receptaculum pollinis fusiforme. Fructus cylindricus, bicostatus, glaber, costis maturitate repli instar remanentibus. Semina carunculata.

Species duae terrae Borneënsis partes septentrionalem et orientalem habitantes. Subgeneris typus: *A. siliquosa* Brem. n. spec. v. infra.

KEY TO THE SPECIES

Leaves with 10–12 pairs of nerves. Inflorescence laxly paniculate, many-flowered. — East Borneo.....6. *A. siliquosa*
Leaves with 6–8 pairs of nerves. Inflorescence cymose, 2- to 7-flowered. — North Borneo.....7. *A. ophiorrhizoides*

6. **Acranthera siliquosa** Brem. n. spec.; typus: *Endert 3368* (BZ).

Herba suberecta, usque ad 2.5 m. alta. Caulis sympodialis, diametro ad apicem 2 mm. basin versus usque ad 5 mm. aucto, glaberrimus, sicc. fuscescens, internodiis 2–7.5 cm. longis. Folia petiolo 2–6 cm. longo, glaberrimo instructa; lamina oblonga vel obovata, 12–24 cm. longa et 5–8.5 cm. lata, apice caudato-acuminata, basi cuneata vel contracta, margine pilis brevibus sparse et vix conspicue strigosa, ceterum glaberrima, membranacea, utrimque opaca, sicc. supra saturate olivacea, subtus dilute olivacea vel olivaceo-brunnea, nervis plerumque saturate olivaceo-brunneis distincte notata, nervis utroque latere costae 10–12. Stipulae apiculo incluso 3 mm. altae, costa et basi incrassatae, totae glabrae. Inflorescentia breviter pedunculata, laxe paniculiformis, glabra; pedunculus 5–15 mm. longus; rachis 7–12 cm. longa; ramuli ultimi monochasiales, post anthesin maxime 1 cm. longi et cicatricibus maxime 5 notati; bracteae ramulorum primariorum subulatae, 5 mm. longae, aliae minores, ultimae vix 1 mm. longae, omnes subpersistentes. Flores subsessiles; pedicelli post anthesin

tamen usque ad 5 mm. elongantes. Ovarium cylindricum, circ. 10 mm. longum et vix 0.5 mm. diam., glabrum. Calycis lobi lineares, 7 mm. longi et 0.5 mm. lati, acuti, glabri. Corollae tubus 10 mm. longus et 4 mm. diam.; lobi 2.5 mm. longi latique, mucronati. Stamina 6.5 mm. longa; filamenta 1 mm.; antherae 5.5 mm. longae, connectivo in appendicem rectam 0.5 mm. longam exeunte. Stylus in stigmata subulata, 0.7 mm. longa exeuns. Fructus 4 cm. longus et 1.5 mm. diam., viridis.

Habitat terrae Borneënsis partem orientalem.

BORNEO: Eastern and Southern Division. West Kutai: Liak Petak, alt. 450 m., *Endert 3368* (BZ, typus); ibidem, Liak Leng, alt. 250 m., *id. 2998* (BZ, co-typus fructifer).

7. **Acranthera ophiorrhizoides** Val. in Ic. Bog. 4: 287, t. 397. 1914. — North Borneo.

I am not fully certain that this species, of which no material was available, really belongs to *Cleomocarpus*. It resembles *A. siliquosa* in the nature of the stipules, the nearly glabrous leaves, the terminal inflorescence and the small size and white colour of the flowers. The fruits are imperfectly known; in Valeton's specimens they were apparently immature, and with regard to the presence or absence of a replum there is, therefore, no certainty. The anthers have been described as bearded, and figured as ciliolate, but I suppose they are neither. Valeton's specimens were apparently badly preserved, and it is, therefore, quite possible that the presence of cilia was simulated by the mycelium of a fungus with which the anthers were overgrown.

SUBGENUS D. AMPHOTEROSANTHUS BREM. SUBGEN. NOV.

Herbae altiores. Folia supra glaberrima, laxe reticulata. Stipulae triangulares, in cupulam brevem connatae, apice appendiculatae, internodiis multo breviores, persistentes. Inflorescentiae brachyblastos oppositos, foliis rudimentariis instructos terminantes, pauciflorae. Calycis lobi lanceolati vel ovati. Corolla in specie sola ubi color notus est viridula; tubus campanulatus. Stamina filamentis glabris et liberis, quam antheris brevioribus, antheris ecilolatis, connectivo carinato instructis. Discus inconspicuus. Receptaculum pollinis fusiforme. Fructus cylindricus, 5- vel 6-costatus. Semina reticulata.

Species adhuc certe notae tres Sumatram et insulas ad occasum habitantes. Subgeneris typus: *A. longipes* Merr.

As the two *Psilobium* species of Jack and Korthals's *Gonyanera glauca* are provided with "axillary" inflorescences or flowers and elongated ovaries and fruits, there can be little doubt that they belong to this subgenus. The exserted sexual organs distinguish them from *A. longipes* Merr., the only species of which flowers were available. The description of *Psilobium nutans* Jack says that the leaves are lanceolate and smooth, and that the peduncles bear three to six flowers, whereas in *Ps. tomentosum* Jack the inflorescences are apparently uniflorous and the leaves tomentose. The leaves of *Gonyanera glauca* Khs. are said to be elliptic and the calyx-lobes ovate, and the inflorescences of this species too appear to be uniflorous. That these meagre indications would suffice for the identification of these species, seems excluded.

KEY TO THE SPECIES

Shoots, petioles and fruits glabrous. Petioles 4.5–9 cm.; lamina 25–32 cm. long. — East Sumatra.....8. *A. longipes*

Shoots, petioles and fruits strigose. Petioles not more than 3 cm.; lamina not more than 20 cm. long.

Stipules 10–15 mm. long. Calyx-lobes ovate-oblong, 6 × 4 mm. — East Sumatra. .....9. *A. Yatesii*

Stipules 7–10 mm. long. Calyx-lobes linear-lanceolate, 12 × 2.5 mm. — Siamalur. .....10. *A. simalurensis*

8. **Acranthera longipes** Merr. in Papers Mich. Acad. Sci. 19: 193. 1934; non Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 284. 1937, homon. illeg. (cf. *A. longipetiolata* Merr. ex Brem. n. nom.).

Herba robusta sed altitudine ignota. Caulis mox totus glaber, diametro ad apicem 2.5 mm., basin versus usque ad 8 mm. aucto, internodiis 1–2.5 cm. longis. Folia petiolo 4.5–9 cm. longo, glabro instructa; lamina oblanceolata, 25–32 cm. longa et 7.5–10 cm. lata, apice breviter vel longius acuminata, basi acuta vel cuneata, margine pilis brevibus vix conspicue strigosa, subtus primum costa nervisque densius, inter nervos sparse, deinde costa nervisque sparse strigosa, utrimque opaca, sicc. supra olivaceo-brunnea, subtus fusca, nervis utroque latere costae plerumque 11. Stipulae 5–7 mm. longae et 6–7 mm. latae, apice colletris pluribus et infra apicem fasciculo pilorum instructae. Inflorescentiae basi foliis rudimentariis 2.5 mm. longis instructae, 3-florae; bracteae florum lateralium lanceolatae, 5 mm. longae. Flores pedicello strigoso, 2.5 mm. longo elati. Ovarium cylindricum, 10 mm. longum et 1 mm. diam., strigosum. Calycis lobi oblanceolati, 7.5 mm. longi et 1.8 mm. lati, acuti, utrimque glabri, 7-nervii. Corolla colore ignoto, 14.5 mm. longa; extus glabra; tubus 12 mm. longus et 7 mm. diam.; lobi late ovati, 5 mm. lati et 2.5 mm. longi. Stamina 8.5 mm. longa; filamenta 2 mm.; antherae 6.5 mm. longae, connectivo in apiculam brevem producto. Receptaculum pollinis 5.5 mm. longum, apice acuto bifido. Fructus 4–4.5 cm. longus et 3 mm. diam., glaber, pericarpio tenui.

Habitat Sumatram Orientalem.

SUMATRA: East Coast Gouvt: Asahan, Merbau, Bila, near Bila Pertama (Perbarian), *Rahmat 3.5* (AA, dupl. typi fructiferi); ibidem, near Lumban Ria, *id. 7431* (AA); ibidem, near H. Bagasan, *id. 6832* (AA), *7231* (AA, co-typus meus florifer).

Vernacular names: kaju lambok, kaju si martumbus.

9. **Acranthera Yatesii** Merr. in Papers Mich. Acad. Sci. 19: 193. 1934. — East Sumatra.

This species, which I could not investigate myself, differs from *A. longipes* in the much shorter petioles, the smaller size of the leaves and their more conspicuously pilose underside, in the up to 1.5 cm. long stipules, the ovate-oblong calyx-lobes and the hairy fruits. From *A. simalurensis* it differs in the larger size of the stipules and in the shorter and wider calyx-lobes. It was collected in the same region as *A. longipes*, namely in the East Coast Gouvernment (District Pematang Siantar, Dk Tinggi Radja, alt. 500 m., *Yates 2153*). The flowers are still unknown.

10. **Acranthera simalurensis** Brem. n. spec.; typus: *Achmad 141* (L).

Herba robusta sed altitudine ignota. Caulis pilis ferrugineis primum dense, deinde sparse hirsuto-strigosus, diametro ad apicem 2.5 mm., basin versus usque ad 8 mm. aucto, internodiis 1.2–5.5 cm. longis. Folia petiolo 1.5–3 cm. longo, dense hirsuto-strigoso instructa; lamina lanceolata vel oblanceolata, 11–18 cm. longa et 4–7.5 cm. lata, breviter vel longius acuminata, basi acuta vel cuneata, margine pilis brevibus strigosa, subtus costa nervisque pilis stramineis dense, inter nervos sparse strigosa, utrimque opaca, sicc. supra olivaceo-brunnea vel nigrescens, subtus fusca, nervis utroque latere costae 10 vel 11. Stipulae 7–10 mm. longae et 5–7 mm. latae, apice colletris pluribus instructae, costa praesertim apicem versus hirsuto-strigosa. Inflorescentiae basi foliis rudimentariis 3 mm. longis instructae, 1- usque ad 3-florae; bracteae florum lateralium lanceolatae, 5 mm. longae. Flores nondum visi. Fructus pedicello strigoso, 5 mm. longo elatus, 3 cm. longus et 2.5 mm. diam., strigosus, calycis lobis linearilanceolatis, 12 mm. longis et 2.5 mm. latis, acutis coronatus, pericarpio tenui.

Habitat insulam a Sumatra ad occasum Simalur dictam.

SIMALUR: s.l., *Achmad 141* (L, typus).

Vernacular name: gulamang gadjah.

Valeton had recognized in Achmad's specimen a new *Acranthera* species, for which he proposed the specific epithet "*mutica*," but a description was never published. The name "*mutica*" has probably been used in opposition to "*Acranthera*," and would mean that the anthers are blunt, but as this can hardly be right, I have chosen another epithet. If the name really referred to the shape of the anthers, it would prove that Valeton had seen flowers, which in the Leiden specimens were not present; the Buitenzorg material, therefore, would be more complete.

SUBGENUS E. PHANEROCHITON BREM. SUBGEN. NOV.

Herba robusta, suberecta. Folia supra cellulis resiniferis sicc. sub lente nigro-punctata, laxe reticulata. Stipulae oblongae, apice acuto longe apiculatae, maximae, extus bis inde colletris instructae, laxe reticulatae. Inflorescentia terminalis, nunc trichotome corymbosa et subsessilis, nunc ramulis lateralibus suppressis longius pedunculata; ramuli ulteriores bracteis magnis imbricatis instructi. Corolla rubella, tubo infundibuliformi. Stamina filamentis quam antheris multo brevioribus, antheris connectivo carinato, granulato et ciliolato. Discus inconspicuus. Receptaculum pollinis thecis paulo brevius, fusiforme. Fructus ovoideus, pericarpio et dissepimento crassis. Semina reticulata.

Subgenus adhuc monotypicum terrae Borneënsis partem occidentalem habitans. Subgeneris typus: *A. involucrata* Val.

11. **Acranthera involucrata** Val. in Ic. Bog. 4: 279, t. 393. 1914.

Herba robusta sed altitudine ignota. Caulis dense velutino-hirsutus, diametro 6–9 mm., internodiis 1.5–5 cm. longis, inferioribus tamen non visis. Folia petiolo 2–4 cm. longo, dense velutino-hirsuto instructa; lamina obovata, 12.5–35 cm. longa et 5.2–12 cm. lata, apice caudato-acuminata,

basi sensim in petiolum contracta, margine primum dense, deinde sparsius velutino-hirsuta, supra costa per totam longitudinem velutino-hirsuta excepta glaberrima, subtus costa nervisque densissime velutino-hirsuta, venulis sparsius velutinis, inter venulos primum dense, deinde sparse villosa, supra nitidula, sicc. supra saturate rubro-brunnea, subtus fusca, nervis utroque latere costae 12–20. Stipulae usque ad 6.5 cm. longae et 1.7 cm. latae, basi circ. 1 cm. connatae, extus costa prominente sicut margine dense velutino-hirsutae, ceterum sparse villosae, scariosae, sicc. brunneae, persistentes. Inflorescentiae ramuli primarii et rachis aut, si ramuli suppressi, pseudo-pedunculus 3–5 cm. longi, dense velutino-hirsuti; ramuli alii breves et flores igitur sub bracteis magnis latentes; bracteae ramulorum primariorum deciduae, nondum visae, ramulorum secundariorum ovatae, 3.5 cm. longae et 2.5 cm. latae, aliae gradatim minores et praesertim angustiores, dense imbricatae, minime usque ad anthesin persistentes; omnes ubique sed praesertim margine et costa pubescentes. Flores pedicellati. Pedicellus 5 mm. longus, dense velutinus. Ovarium breviter cylindricum, 6 mm. longum et 2 mm. diam., dense velutinum. Calycis lobi oblanceolati, 10 mm. longi et 3.5–4 mm. lati, acuti, extus intusque sparse, margine et costa densius pubescentes. Corolla (forsitan nondum plene matura) 11 mm. longa, extus sparse, margine densius villosa; tubus 6 mm. longus et ad orem 7 mm. diam.; lobi ovati, 5 mm. longi et basi 4.5 mm. lati, acuti. Stamina 8.5 mm. longa; filamenta 1.5 mm.; antherae 7 mm. longae, connectivo in appendicem vix 0.5 mm. longam producto. Stylus apice conica vix divisus. Fructus circ. 10 mm. diam.

Habitat terrae Borneënsis partem occidentalem.

SARAWAK: near Kuching, *Haviland* & *Hose*, 8. IX. 1892 (AA); *Haviland*, 15. IX. 1892; s.l., *nat. coll. 2018* (AA). BORNEO: Western Division: Upper Kapuas Mts., base of G. Damus, *Hallier 486* (L).

This species is, apart from the much denser indumentum and the persistent bracts, habitually not unlike *A. frutescens* Val., from which it differs, however, in the following important points: the presence of resin-cells in the epidermis of the upper side of the leaf, the infundibuliform corolla-tube, the greater length and fusiform shape of the *receptaculum pollinis*, and the thick-walled fruit. The thick dissepiment distinguishes this plant from all other species of this genus of which the fruits are known. The wide range of variability in the number of nerve pairs is rather remarkable: it may be observed even in one and the same specimen.

SUBGENUS F. DICHROANTHES BREM. SUBGEN. NOV.

Herbae humiles, ascendentes vel subrosulares. Folia laxe reticulata. Stipulae oblongae, lanceolato-oblongae, ellipticae vel ovatae, internodiis longiores, extus hic inde colletris sparsae, laxe reticulatae. Inflorescentiae nunc terminales, nunc brachyblastos oppositos, basi foliis rudimentariis instructos terminantes, umbelliformes vel ad florem singulum redactae. Calycis lobi interdum colorati. Corolla, ubi color notus, rubra, aurantiaca vel lutea, tubo infundibuliformi vel anguste campanulato. Stamina filamentis glabris et liberis, quam antherae nunc paulo brevioribus, nunc paulo longioribus, antheris connectivo nunc carinato, nunc convexo, sed semper minime basi ciliolato, in appendicem brevem producto. Discus

inconspicuus. *Receptaculum pollinis* thecis paulo brevius, vix incrassatum. Fructus adhuc imperfecte notus, probabiliter cylindricus, 6-costatus.

Species adhuc notae duodecim terram Borneënsem habitantes. Subgeneris typus: *A. salmonea* Brem. n. spec. v. infra.

KEY TO THE SPECIES

Inflorescence at the end of the stem. Stigmata cohering.....Series a. **Sympodiales**
Calyx-lobes 17–18 mm. long. Corolla-tube infundibuliform. Connective carinate and granulate.
Leaves bullate and provided with 13–15 pairs of nerves. Inflorescence with several flowers. Calyx and corolla both red. — West, Borneo.....12. *A. bullata*
Leaves without blisters and provided with 6–8 pairs of nerves only. Inflorescence with 1 or 2 flowers only.
Leaves mostly less than 13 cm. long and 5 cm. wide, entirely glabrous above. Bracts 7 mm. long. Pedicel up to 10 mm. long. — West Borneo.....13. *A. Johannis-Winkleri*
Leaves mostly more than 13 cm. long and 5 cm. wide; midrib on the upper side strigose. Bracts 2–3 mm. long. Pedicel more than 2 cm. long. — North ? Borneo.....14. *A. monantha*
Calyx-lobes 10–12 mm. long. Corolla-tube narrowly campanulate. Connective neither carinate nor granulate.
Leaves variegated, entirely glabrous on the upper side. Inflorescence with 6–12 flowers. Corolla sulphur-yellow. Anthers 6.5 mm. long. — West Borneo.....15. *A. variegata*
Leaves entirely green, with a few long appressed hairs on the upper side. Inflorescence with 4–6 flowers. Corolla orange. Anthers 11 mm. long. — West Borneo.....16. *A. aurantiaca*
Inflorescences at the end of opposite brachyblasts provided with a pair of rudimentary leaves. Stigmata free.....Series b. **Monopodiales**
Inflorescence umbelliform.
Leaves less than 20 cm. long and provided with 5–8 pairs of nerves. Calyx-lobes 12 mm. long. — East Borneo.....17. *A. salmonea*
Leaves about 30 cm. long and provided with 13 pairs of nerves. Calyx-lobes 20 mm. long. — Borneo.....18. *A. megaphylla*
Inflorescence usually reduced to a single flower.
Leaves with about 10 pairs of nerves. Stipules more than 3 cm. long. — West Borneo.....19. *A. longipetiolata*
Leaves with less than 10 pairs of nerves. Stipules less than 2.5 cm. long.
Calyx-lobes ovate-lanceolate.
Midrib and nerves on the underside densely white-pubescent. — Southeast Borneo.....20. *A. axilliflora*
Midrib and nerves on the underside densely ferrugineous-pubescent. — West Borneo.....21. *A. abbreviata*
Calyx-lobes linear-lanceolate or narrowly triangular.
Leaves entirely green, provided with about 8 pairs of nerves. Stipules 5–12 mm. long. Corolla 2–2.5 cm. long. — Central Borneo.....22. *A. hirtistipula*
Leaves variegated, provided with 4–5 pairs of nerves. Stipules 12–20 mm. long. Corolla 3–4.5 cm. long. — Central Borneo.....23. *A. maculata*

Series A. SYMPODIALES

Inflorescentiae caulem terminantes. Stigmata cohaerentia. — Species 12–16.

12. **Acranthera bullata** Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 284. 1937.

Herba ascendens, circ. 12 cm. alta, interdum pseudo-dichotome ramificata. Caulis primum pilis curvis breviter et parce substrigosus, deinde glabrescens, diametro ad apicem 5 mm., basin versus usque ad 7 mm. aucto, internodiis raro plus quam 1 cm. longis. Folia petiolo 1–4 cm. longo, pilis curvis breviter fulvo-strigoso instructa; lamina obovata, 11–18 cm. longa et 6–9 cm. lata, apice breviter acuminata, basi plerumque subtruncata sed prope petiolum subito contracta, interdum tamen acuta, margine pilis pro parte longioribus primum albidis, deinde fulvis, primum dense, deinde sparsius substrigosa, supra glaberrima, subtus costa nervis venulis pilis brevibus curvis fulvis dense substrigosa, utrimque opaca, supra vivo olivacea, sicc. olivaceo-brunnea, subtus vivo laete rubra, sicc. fuscescens, inter venulos principales conspicue bullata, nervis utroque latere costae 13–15, venulis principalibus nervos transverse connectentibus, remotioribus, aliis paucis et vix conspicuis. Stipulae ellipticae, 1.5–2.5 cm. longae et 1.2–2 cm. latae, acutae vel subacutae, sed costa semper in mucronem satis longam producta, extus sparse et breviter strigosae, costa prominente, subpatentes, persistentes. Inflorescentia subsessilis, umbelliformis, multiflora; bracteae lineares, 6 mm. longae et 0.7 mm. latae, margine densius, alibi pilis brevibus parce strigosae. Flores pedicello pilis brevissimis dense griseo-strigoso, usque ad 10 mm. longo instructi. Ovarium cylindricum, 10 mm. longum et 0.8 mm. diam., ut pedicellus dense griseo-strigosum. Calycis lobi rubri, lanceolati, 18 mm. longi et 4.5–6 mm. lati, acuti, margine densius, ceterum extus intusque sparse puberulo-strigosi, 7-nervii. Corolla rubra, 2.9 cm. longa, margine dense, ceterum extus sparse puberulo-strigosa; tubus infundibuliformis, 1.7 cm. longus et ad orem 1.0 cm. diam.; lobi ovato-triangulares 9 mm. longi et basi 5.5 mm. lati. Stamina 1.8 cm. longa; filamenta 8 mm.; antherae 10 mm. longae, connectivo carinato et granulato in appendicem circ. 0.5 mm. longam producto. Fructus nondum notus.

Habitat terrae Borneënsis partem occidentalem.

Borneo: Western Division: Sintang, S. Malang, 113° 20′ E.long., 1° N.lat., alt. 70 m., *Winkler 1298* (HBG, typus); ibidem, S. Gulu, 112° 25′ E.long., 0° 16′ N.lat., alt. 150 m., *id. 181* (HBG), n.v.

A specimen collected by the Expedition *Nieuwenhuis* near the S. Blu-u (*541* [L], *A. multinervia* Val. in sched.) comes very near to the plant described above, and may be conspecific. Its leaves, however, are less distinctly bullate, the hairs on the nerves are more patent, and the pedicels and ovaries less densely grey-strigose; that the thecae seem to be less distinctly ciliolate and the connective but indistinctly granulate, may be due to the immaturity of the buds and their bad state of preservation.

The inflorescence of *A. bullata* has three main branches, but the latter are so short that their existence is easily overlooked. From a morphological point of view their presence, nevertheless, is of importance, because it shows that the umbelliform inflorescence of this subgenus is to be derived from the trichotomously corymbose one found in several other subgenera.

Acranthera bullata is easily distinguishable by its bullate leaves. It comes nearest to *A. Johannis-Winkleri* Merr. and *A. monantha* Val., which it resembles in the great length of the calyx-lobes and the infundibuliform

corolla, but from which it differs in the many-nerved leaves and the several-flowered inflorescences.

13. **Acranthera Johannis-Winkleri** Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 285. 1937.

Herba ascendens, usque ad 25 cm. alta, ad anthesin interdum decumbens et e basi enovationes emittens. Caulis primum villosus, deinde glabrescens, diametro ad apicem 2 mm., basin versus usque ad 4 mm. aucto, internodiis 0.5–2.5 cm. longis. Folia petiolo 1–4 cm. longo, primum dense, deinde sparse villoso instructa; lamina elliptica vel obovata, 4–13.5 cm. longa et 1.8–5.2 cm. lata, apice subacuminata, basi cuneata, margine pilis stramineis longis primum dense, deinde sparsius substrigosa, supra glaberrima, subtus sparse sed costa nervisque densius villosa, utrimque opaca, supra sicc. olivacea, subtus fusca, nervis utroque latere costae 6 vel 7. Stipulae oblongae, 1–2 cm. longae et 3–7 mm. latae, obtusae vel acutae sed semper mucronatae, extus sparse villosae, costa prominula, ante folia deciduae. Inflorescentia subsessilis, 1- vel 2-flora, mox a ramulo axillari in positionem lateralem coacta; bracteae oblongae, 7 mm. longae et 3 mm. latae. Flores pedicello densius griseo-villoso, usque ad 10 mm. longo elati. Ovarium rubellum, cylindricum, 9 mm. longum et 0.7 mm. diam., densius griseo-villosum. Calycis lobi laete virides, lanceolati, 17 mm. longi et 3.5–4 mm. lati, acuti, extus intusque sparse, margine densius pubescentes, 7-nervii, nervis lateralibus a venulis interdum vix distinguendis. Corolla aurantiaca, 3.7 cm. longa, 5- vel 6-mera, extus praesertim basin versus pilis brevibus pubescens; tubus infundibuliformis, 2 cm. longus et ad orem 1 cm. diam.; lobi triangulares 17 mm. longi et basi 6 mm. lati. Stamina 1.7 cm. longa; filamenta 7.5 mm.; antherae 9.5 mm. longae, connectivo carinato et granulato in appendicem circ. 0.5 mm. longam producto. Fructus cylindricus, nondum plene maturus 16 mm. longus et 2.5 mm. diam., 6-costatus, sparse griseo-pubescens.

Habitat terrae Borneënsis partem occidentalem.

BORNEO: Western Division: Sintang, S. Raun, 113° 15′ E.long., 0° 40′ N.lat., alt. 200 m., *Winkler 1559* (HBG, typus); S.Obat, 113° 20′ E.long., 0° 55′ N.lat., alt. 80 m., *id. 1389* (HBG) n.v.

If we may assume that the form and structure of the fruit of this species is typical for the whole subgenus, the difference between the latter and the subgenus *Phanerochiton* becomes still more prominent.

Acranthera Johannis-Winkleri resembles *A. bullata* in the long calyx-lobes, the infundibuliform corolla-tube and the carinate and granulate connective, but is easily distinguishable by the smooth leaves, the smaller stipules, 1- or 2-flowered inflorescence, the greenish colour of the calyx-lobes and the orange colour of the corolla, and the greater length of the latter's lobes. *Acranthera monantha* Val. is probably even more closely allied, but comparison is made difficult by the circumstance that we have no information with regard to the connective and with regard to the colour of calyx and corolla. On account of the very close resemblance in other respects, the connective will probably prove to be carinate and granulate: in the key to the species use has already been made of this character.

From *A. variegata* Merr. and *A. aurantiaca* Val. ex Brem. both *A.*

Johannis-Winkleri and *A. bullata* differ in the shape of the corolla-tube, the greater length of the calyx-lobes, the longer filaments and the distinctly carinate and granulate connective.

14. **Acranthera monantha** Val. in Bot. Jahrb. 48: 111. 1912. — North ? Borneo.

Of this species I have seen no specimens, but judging from the description there can be little doubt that it is nearly related to *A. Johannis-Winkleri* Merr. No information, however, is available with regard to the flower-colour, the shape of the connective and that of the *receptaculum pollinis*. The plant, moreover, is described as unisexual, but this is doubtless a mistake. The type, *Beccari 3154*, was, according to Valeton l.c., collected in North Borneo, but as some other specimens whose numbers differ but slightly from that of this plant, are known to have been collected in Sarawak, I suppose that this is a mistake.

15. **Acranthera variegata** Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 285. 1937.

Herba subrosularis. Caulis ad apicem pilis brevibus satis dense griseo-strigosus, basin versus plus minusve glabrescens, diametro ad apicem 1.2 mm., basin versus usque ad 4 mm. aucto, internodiis 5–10 mm. longis. Folia petiolo 0.4–2 cm. longo, pilis brevibus satis dense griseo- vel fulvo-strigoso instructa; lamina obovata, 7–16 cm. longa et 3–6.7 cm. lata, apice breviter acuminata, basi acuta vel saepius subtruncata et prope petiolum subito contracta, margine dense fulvo-strigosa, supra glaberrima, subtus costa nervisque pilis brevibus dense fulvo-strigosa, venulis pilis brevibus minus dense strigosis, utrimque opaca, maculis irregularibus albo-variegata, sicc. supra olivacea, subtus fusca, nervis utroque latere costae 4 vel 5. Stipulae ovato-oblongae, circ. 1 cm. longae et 4 mm. latae, subacutae, extus sparse strigosae, costa prominente, subpersistentes. Inflorescentia subsessilis, umbelliformis, floribus 6–12; bracteae lineari-filiformes, circ. 4 mm. longae. Flores pedicello pilis brevissimis dense griseo-strigoso usque ad 1.5 cm. longo elati. Ovarium cylindricum, 5 mm. longum et 0.8 mm. diam., ut pedicellus dense griseo-strigosum. Calycis lobi laete virides, lanceolati, 10 mm. longi et 1.8–2.2 mm. lati, acuti, extus costa et margine pilis brevibus densius, ceterum sparse strigosi, 5-nervii. Corolla laete sulphurea, 18.5 mm. longa, margine densius, ceterum extus sparse et brevissime griseo-strigosa; tubus anguste campanulatus, 10 mm. longus et 4 mm. diam.; lobi oblongi, 8.5 mm. longi et 2.5 mm. lati. Stamina 8.5 mm. longa; filamenta 2 mm.; antherae 6.5 mm. longae, thecis basi solum ciliolatis, connectivo nec granulato nec carinato in appendicem vix conspicuam producto. Fructum nondum vidi; fide *Merrill* l.c. subteres vel rotundato-angulatus, 1 cm. longus et 2–2.5 mm. diam.

Habitat terrae Borneënsis partem occidentalem.

BORNEO: Western Division: Sintang, S. Malang, 113° 20′ E.long., 1° N.lat., *Winkler 1294* (HBG, typus).

So far three species of *Acranthera* are known to be provided with variegated leaves. The two others are: *A. maculata* Val. and *A. Hallierii* Val. *Acranthera maculata* also belongs to the subgenus *Dichroanthes*, but to the series Monopodiales; it is moreover easily distinguishable from *A. variegata* by its solitary flowers. *Acranthera Hallierii* has a mitriform *receptaculum pollinis*, and belongs therefore to the subgenus *Mitracme*.

It differs further from *A. variegata* in the presence of 6–7 pairs of nerves in the leaves, the deciduous stipules, and the position of the inflorescences, which are not found at the end of the stem, but at the end of opposite brachyblasts.

The nearest ally of this species is doubtless *A. aurantiaca* Val. ex Brem., whose leaves are longer and narrower, on the upper side strewn with a few hairs, and entirely green, and whose inflorescences consist of fewer but larger flowers.

A peculiarity of *A. variegata* not mentioned in the description, is the presence of a ring of cohering colleters on the inside of the calyx; it is produced in triangular slips between the calyx-lobes. In all other species the number of colleters is so much smaller that they are unable to form a complete ring; sometimes, however, they cohere in groups, especially in the gaps between the calyx-lobes.

16. **Acranthera aurantiaca** Val. in sched.; typus: *Teysmann H.B. 8031* (L).

Herba subrosularis. Caulis ad apicem satis dense griseo-strigosus, basin versus plus minusve glabrescens, diametro ad apicem 2.5 mm., basin versus usque ad 5 mm. aucto, internodiis 5–10 mm. longis. Folia petiolo 0.5–2.5 cm. longo, satis dense fulvo-strigoso instructa; lamina obovata vel saepius oblanceolata, 9–16 cm. longa et 4–5 cm. lata, apice acuta vel subacuminata, basi acuta vel cuneata, margine densius strigosa, supra pilis perpaucis sed satis longis strigosa, subtus costa nervisque dense, venulis sparsius fulvo-strigosa, utrimque opaca, haud variegata, sicc. supra olivacea, subtus fusca, nervis utroque latere costae 5 vel 6. Stipulae ovatae, circ. 1 cm. longae et 8 mm. latae, subacutae, extus sparse strigosae, costa prominula, sub-persistentes. Inflorescentia subsessilis, umbelliformis, floribus 4–6; bracteae lineares, circ. 5 mm. longae. Flores pedicello pilis brevibus dense griseo-strigoso, usque ad 1.5 cm. longo elati. Ovarium cylindricum, 5 mm. longum et 1 mm. diam., ut pedicellus dense griseo-strigosum. Calycis lobi lineares, 12 mm. longi et 1.8–2.2 mm. lati, acuti, margine et costa pilis brevibus densius, ceterum utrimque sparse strigosi, 3- vel 5-nervii. Corolla aurantiaca, in exemplo solo praeservato apice ab insectis destructa, extus pilis brevibus sparse strigosa; tubus anguste campanulatus minime 15 mm. longus et 4 mm. diam. Stamina 16 mm. longa; filamenta 5 mm.; antherae 11 mm. longae, thecis basi solum et vix conspicue ciliolatis, connectivo nec carinato nec granulato in appendicem brevissimam producto. Fructus nondum notus.

Habitat terrae Borneënsis partem occidentalem.

Borneo: Western Division: Singkawang, Passi (circ. 109° E.long., 1° N.lat.), *Teysmann H.B. 8031* (L, typus).

The differences between this species and the preceding one have been summarized in the note attached to the latter.

Series B. MONOPODIALES

Inflorescentiae brachyblastos oppositos, uno jugo foliorum rudimentariorum instructos terminantes. Stigmata libera, subulata. — Species 17–23.

17. **Acranthera salmonea** Brem. n. spec.; typus: *Rutten 119* (U).

Herba ascendens, circ. 30 cm. alta. Caulis primum pilis fulvis breviter substrigosus, deinde plus minusve glabrescens, diametro ad apicem 2.5 mm., basin versus usque ad 4 mm. aucto, internodiis 2.2–6.5 cm. longis. Folia petiolo 2.5–4.5 cm. longo, pilis brevibus fulvis primum dense, deinde sparsius substrigoso instructa; lamina obovata, 10.5–17 cm. longa et 4.2–6.2 cm. lata, apice acuta vel breviter acuminata, basi cuneata, margine primum densissime, deinde minus dense strigosa, supra glaberrima, subtus costa nervisque pilis longioribus densissime fulvo-strigosa, venulis pilis brevibus densissime, inter venulos sparse strigosa, utrimque opaca, sicc. supra olivaceo-brunnea vel subnigra, subtus fusca, nervis utroque latere costae 5–8. Stipulae oblongae vel ovato-oblongae, 2.2 cm. longae et 8–13 mm. latae, subacutae, extus sparse, margine densius strigosae, costa basin versus prominula, ante folia deciduae. Inflorescentiae basi foliis duobus ovatis, 15 mm. longis et 7.5 mm. latis instructae, sessiles, umbelliformes, 5-usque ad 9-florae; bracteae lineari-lanceolatae, 5 mm. longae et 1 mm. latae. Flores pedicello pilis brevibus densius griseo-strigoso, usque ad 1.5 cm. longo elati. Ovarium cylindricum, 12 mm. longum et 1 mm. diam., ut pedicellus dense griseo-strigosum. Calycis lobi lineari-lanceolati vel lanceolati, 12 mm. longi et 2.5–5 mm. lati, acuti et mucronati, rubri, utrimque pilis brevissimis sparse, margine densius strigosi, 5-nervii. Corolla salmonea, 3 cm. longa, extus pilis brevissimis sparse, margine densius strigosa; tubus anguste campanulatus, 2.5 cm. longus et 8 mm. diam.; lobi ovati, 5.5 mm. longi latique, acuti. Stamina 2.2 cm. longa; filamenta 13 mm.; antherae 9 mm. longae, connectivo carinato et granulato, basin versus valde gibboso, apice in appendicem crassiusculam, vix 0.5 mm. longam producto. Receptaculum pollinis squamis fungiformibus obtectum. Fructus nondum notus.

Habitat terrae Borneënsis partem orientalem.

BORNEO: Southern and Eastern Division: Samarinda, above Pamaluan, 116° E.long., 1° S.lat., *Rutten 119* (U, typus), "on the river bank in primary forest": the lower part of the stem and the lower leaves of his specimen indeed are covered with mud.

The papillae by which the *receptaculum pollinis* of this and the two next species is covered, are somewhat different from those of the species previously dealt with: they are united to fungiform scales, i.e. at the base they form a rather thick stipe and spread at the top. In the species 20–23 their structure is unknown; Valeton's fig. 7 on t. 395 of Ic. Bog. 4: suggests that they may be of a similar nature in *A. maculata*.

Acranthera salmonea resembles the next species, *A. megaphylla* Brem., in the umbelliform inflorescence, but is easily distinguishable by the smaller size of the leaves and stipules and by the shorter calyx-lobes.

18. **Acranthera megaphylla** Brem. n. spec.; typus: *Coll. ign. H.B. 409* (L).

Probabiliter planta ascendens. Caulis glaber, diametro ad apicem 8 mm., basin versus aucto, internodiis paucis preservatis circ. 1 cm. longis. Folia petiolo 12–12.5 cm. longo, breviter et sparse strigoso instructa; lamina obovata, circ. 30 cm. longa et 12 cm. lata, apice caudato-acuminata, basi acuta vel subcontracta, margine satis dense sed vix conspicue strigosa,

supra costa quae basin versus est breviter et satis dense strigosa excepta glaberrima, subtus costa nervisque pilis brevibus densissime fulvo-strigosa, inter nervos pilis brevissimis parce strigosa, utrimque opaca, sicc. supra rubro-brunnea, subtus fusca, nervis utroque latere costae 13. Stipulae lanceolato-oblongae, 3.5–4.5 cm. longae et 10–13 mm. latae, acutae, extus pilis brevibus satis dense, margine densius strigosae, costa prominente, subpersistentes. Inflorescentiae basi foliis duobus ovato-lanceolatis, 13 mm. longis et 5.5 mm. latis instructae, sessiles, umbelliformes, 5-florae; bracteae lineari-lanceolatae, 12 mm. longae et 3 mm. latae. Flores pedicello pilis brevissimis densissime griseo-strigoso, circ. 5 mm. longo elati. Ovarium cylindricum, 10 mm. longum et 1 mm. diam., ut pedicellus densissime griseo-strigosum. Calycis lobi lineares, 20 mm. longi et 4–5 mm. lati, acuti, pilis brevissimis extus densius, intus sparsius strigosi, costa prominula, 5-nervii. Corolla colore ignoto, in exemplo examinato nondum plene matura 15 mm. longa, extus pilis brevissimis densissime strigosa; tubus anguste campanulatus 10 mm. longus et 4 mm. diam.; lobi ovati, 5 mm. longi et 4 mm. lati, acuti. Stamina filamentis nondum elongatis; antherae 10 mm. longae, connectivo carinato et granulato, basin versus gibboso, in appendicem 0.6 mm. longam producto. Receptaculum pollinis squamis fungiformibus obtectum. Fructus nondum notus.

Habitat terram Borneënsem, probabiliter partem centralem.

BORNEO: s.l., *Collector ignotus H.B. 409* (L, typus).

The Leiden herbarium received this specimen from Buitenzorg, but neither the name of the collector nor the exact locality is given. It may have been one of the plants collected by the Expedition *Nieuwenhuis;* in that case it will probably have been collected in the central part.

In its umbelliform inflorescences it resembles *A. salmonea;* in the length of the petioles, the large size of the leaf blade and the long stipules, *A. longipetiolata* Merr. ex Brem. The flower buds investigated by me, were apparently very immature: judging from the size of the anthers, I suppose that they will probably reach about the same size as those of *A. salmonea* and *A. longipetiolata.*

19. **Acranthera longipetiolata** Merr. n. nom. in sched., 7. XII. 1937.
Acranthera longipes Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 284. 1937, homon. illeg. nam non Merr. in Papers Mich. Acad. Sci. 19: 194. 1934 (cf. species 8).

Herba ascendens, probabiliter circ. 25 cm. alta. Caulis primum sparse et vix conspicue strigosus, deinde glabrescens, diametro ad apicem 7 mm., basin versus usque ad 12 mm. aucto, internodiis 1–2 cm. longis. Folia petiolo 6–12 cm. longo, pilis brevissimis primum dense griseo-strigoso, deinde sparsius fusco-strigoso instructa; lamina oblonga vel oblongo-obovata, 20–25 cm. longa et 9–10 cm. lata, apice acuminata, basi acuta vel saepius subobtusa sed prope petiolum subito contracta, margine dense griseo-strigosa, supra glaberrima, subtus costa nervisque pilis brevissimis densissime griseo-strigosa, inter nervos pilis brevissimis vix conspicue sed satis dense strigosa, utrimque opaca, sicc. supra saturate rubro-brunnea, subtus fusca, nervis utroque latere costae 10. Stipulae oblongae, 3.5–4.5 cm. longae et 13–16 mm. latae, obtusae, extus pilis brevibus satis dense griseo-strigosae, costa basin versus prominente, persistentes. Inflorescen-

tiae basi foliis duobus rudimentariis ovato-lanceolatis, 15 mm. longis et 6 mm. latis instructae, sessiles, uniflorae. Flos subsessilis. Ovarium cylindricum, 13 mm. longum et 1.5 mm. diam., pilis brevissimis densissime griseo-strigosum. Calycis lobi purpurei, lanceolati, 23 mm. longi et 4–6 mm. lati, acuti, extus intusque pilis brevissimis sparse, margine densius griseo-strigosi, 5-nervii. Corolla rubro-aurantiaca, 3 cm. longa, extus pilis brevissimis sparse, margine densius griseo-strigosa; tubus anguste campanulatus 24 mm. longus et 7 mm. diam.; lobi ovati, 6 mm. longi et basi 5 mm. lati, acuti. Stamina 2.2 cm. longa; filamenta 12 mm.; antherae 10 mm. longae, connectivo carinato et granulato, basin versus gibboso, apice in appendicem crassiusculam, circ. 0.5 mm. longam producto. Receptaculum pollinis squamis fungiformibus obtectum. Fructus nondum notus.

Habitat terrae Borneënsis partem occidentalem.

BORNEO: Western Division: Sintang, Upper Kapuas Mts., Bt Obat, 113° 20′ E.long., 1° N.lat., alt. 150 m., *Winkler 1345* (HBG, typus).

Acranthera longipetiolata differs from the two preceding species in the uniflorous inflorescences, and from the other species belonging to this series in the great length of the petioles and the large size of the leaves and stipules.

An apparently nearly related species is represented by a specimen collected in Sarawak (Nat. coll. *1036* [AA]). Its leaves are much smaller (13–18 cm. × 4.5–6 cm.) attenuate at both ends, and provided with six instead of ten pairs of nerves; the petioles are shorter and very sparsely strigose, and the stipules are nearly glabrous. As flowers and fruits are wanting, it does not seem advisable to name it.

20. **Acranthera axilliflora** Val. in Bot. Jahrb. 44: 550. 1910; Val. in adnot. ad *A. maculatam* Val. in Ic. Bog. 4: 284. 1914. — South-east Borneo.

The type of this species, of which no material was available to me, was collected by Hub. Winkler between Batu Babi and Lumowia in South-east Borneo. The description is in some important points incomplete, but in a note attached to the description of *A. maculata* Val. it is stated that it agrees with the latter in the structure of its inflorescence and flowers, and that it differs from that species in the same way as *A. abbreviata* Val., viz. in the ovate-lanceolate instead of linear calyx-lobes and in the larger size of the leaves with their 6 or 7 instead of 4 or 5 pairs of nerves. Although in the description of *A. abbreviata* itself no mention is made of *A. axilliflora*, the affinity between these two species is apparently closer than that existing between *A. axilliflora* and *A. maculata*. In fact, the only difference between *A. axilliflora* and *A. abbreviata* which could be detected by a comparison of the descriptions, lies in the nature of the indumentum.

21. **Acranthera abbreviata** Val. in Ic. Bog. 4: 181. t. 355. 1913; Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 283. 1937. — West Borneo.

I found a duplicate of the type of this species in the Leiden herbarium, but as it has no flowers, it is not worthwhile describing it.

The details of the flower are badly represented in the figures accompany-

ing Valeton's description, but as the inflorescences are borne on opposite brachyblasts, the filaments long and the thecae ciliolate, there can be no doubt that it belongs to this series.

The type was collected by Hallier at Liang Agang in the Müller Mts. (113° 20′ E.long., 0° 40′ N.lat.). Another specimen was found by Winkler on the Bt. Raja (112° 40′ E.long., 0° 40′ N.lat.) at an altitude of 1250 m. (cf. Merrill l.c.).

22. **Acranthera hirtistipula** Val. in Ic. Bog. 4: 277, t. 392. 1914. — Central Borneo.

Of this species too no material was available to me. Valeton l.c. states that it shows a "superficial" resemblance to *A. maculata* Val., from which it should differ in the small size and deciduousness of the stipules, the number of pairs of nerves, the larger size of the leaf-tip and the stamens. The filaments, namely, are said to be slightly shorter than the anthers, but as the figures show that the flowers investigated by Valeton were not yet fully mature, this is by no means certain. It is quite possible that in the open flower the filaments will prove to be longer. The connective is described as broad and flat, but in fig. 3 it is shown as carinate, and I have little doubt that this is right, and that the resemblance between *A. hirtistipula* and *A. maculata*, therefore, is not merely "superficial," but that the two species are nearly allied. By the aid of the characters given in the key they will, nevertheless, prove easily distinguishable.

23. **Acranthera maculata** Val. in Ic. Bog. 4: 284, t. 395. 1914. — Central Borneo.

Of this species too I have seen no material. The Buitenzorg herbarium apparently possesses a large number of specimens, all collected during the Expedition Nieuwenhuis in Central Borneo. Of one of the specimens the flowers are said to be white, but the colour of the others is not mentioned. The white colour, however, may be a mistake. Figure 8 represents a fruit which is said to belong to this species, but this apparently is wrong, for it is more or less rostrate and lacks the persistent calyx: it might pertain to a *Cyrtandra*. It is possible, therefore, that one of Valeton's specimens was mis-identified, and the white flowers might belong to this one.

Valeton's figure gives the impression that the uppermost flower is terminal, and the others solitary at the nodes; if this were so, this species could not belong to the series Monopodiales. As the description, however, makes no mention of a terminal flower, and as the bifid stigma points in the direction of the species with opposite inflorescences, the impression created by the figure is probably wrong.

Subgenus G. ABLEPHARIDESMA Brem. subgen. nov.

Herbae ascendentes. Caulis pro genere tenuis. Folia pro genere parva, supra glaberrima, paucinervia, venulis paucis laxe reticulatis. Stipulae oblongae, apice acutae, costa prominente, usque ad 1 cm. longae. Inflorescentiae brachyblastos oppositos, foliis rudimentariis munitos ter-

minantes, subsessiles, uniflorae. Flos 4- vel 5-merus, subsessilis. Corolla in specie ubi color notus albida, tubo anguste campanulato. Stamina filamentis glabris et liberis, quam antheris multo brevioribus, antheris haud ciliolatis, connectivo haud carinato, in appendicem brevem producto. Discus inconspicuus. Receptaculum pollinis thecis subaequilongum, fusiforme; stigmata brevia. Fructus cylindricus, fortiter 5- vel 6-costatus. Semina carunculata.

Species adhuc notae duae terram Borneënsem habitantes. Subgeneris typus: *A. Endertii* Brem. n. spec. v. infra.

KEY TO THE SPECIES

Shoots, petioles and underside of the leaves pubescent. Leaves mostly obovate and shortly acuminate. Stipules more or less persistent. Flowers 5-merous. Corolla 17 mm. long. — East Borneo.....24. *A. Endertii*
Shoots, petioles and underside of the leaves strigose. Leaves lanceolate-elliptic, caudate-acuminate. Stipules early deciduous. Flowers 4-merous. Corolla 12 mm. long. — West Borneo.....25. *A. parviflora*

24. **Acranthera Endertii** Brem. n. spec.; typus: *Endert 2605* (BZ).

Herba ascendens, 13–20 cm. alta. Caulis primum pilis fulvis, satis longis dense hirto-pubescens, deinde plus minusve glabrescens, diametro ad apicem 2 mm., basin versus usque ad 4 mm. aucto, internodiis 0.6–2 cm. longis. Folia petiolo 1.2–3 cm. longo, pilis fulvis dense hirto-pubescente instructa; lamina plerumque obovata, foliorum aliquorum tamen oblonga vel lanceolato-elliptica, 5–10.5 cm. longa et 2.8–5 cm. lata, apice breviter acuminata, basi acuta vel prope petiolum subito contracta, margine dense ciliata, subtus costa nervisque pilis fulvis dense hirto-pubescens, venulis principalibus pilis brevioribus dense obtectis, inter venulos primum sparse pubescens, utrimque opaca, sicc. supra olivacea, subtus dilute viridis, nervis utroque latere costae 3 vel 4. Stipulae 6–10 mm. longae et 3.5–4.5 mm. latae, apice et costa hic inde colletris longis sparsae, ubique dense sed costa densissime strigosae, subpersistentes. Inflorescentiae basi foliis duobus ovatis, 3 mm. longis instructae; bracteae duae lineares, vix 2 mm. longae. Flos subsessilis, 5-merus. Ovarium cylindricum, 5.5 mm. longum et 1 mm. diam., breviter sed densissime griseo-strigosum. Calycis lobi lineares, 8 mm. longi et 0.6–0.9 mm. lati, acuti, extus intusque pilis brevissimis dense, margine et costa densissime griseo-strigosi, 3-nervii. Corolla albida, 17 mm. longa, extus pilis brevissimis dense strigosa; tubus 12 mm. longus et 3.5 mm. diam.; lobi ovati, 5 mm. longi et 3.5 mm. lati, acuti. Stamina 8 mm. longa; filamenta 2.5 mm.; antherae 6.5 mm. longae. Fructus 2.5 cm. longus et 3 mm. diam., pilis brevibus sparse strigosus.

Habitat terrae Borneënsis partem orientalem.

BORNEO: Eastern and Southern Division: Samarinda, West Kutai, H. Ibut, alt. 130 m., *Endert 2604* (BZ, typus).

The points of resemblance between this species and *A. parviflora* Val. are sufficiently expressed in the description of the subgenus, the points of difference in the key to the species.

25. **Acranthera parviflora** Val. in Ic. Bog. 4: 289, t. 398. 1914; Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 283. 1937.

Herba ascendens, 25–50 cm. alta. Caulis primum pilis brevissimis dense fulvo-strigosus, deinde plus minusve glabrescens, diametro ad apicem 1.5 mm., basin versus usque ad 4 mm. aucto, internodiis 0.8–5 cm. longis. Folia petiolo 1.5–3 cm. longo, pilis brevissimis strigoso instructa; lamina lanceolato-elliptica, 6.5–9 cm. longa et 2.5–3.8 cm. lata, apice caudato-acuminata, basi acuta, margine pilis brevibus satis dense substrigosa, subtus primum praesertim costa nervisque densissime albido-strigosa, deinde costa nervisque densius, inter nervos ubique sparse et pilorum brevitate et colore fusco vix conspicue strigosa, utrimque opaca, sicc. supra saturate olivaceo-brunnea, subtus brunnea, nervis utroque latere costae 4 vel 5. Stipulae 9–11 mm. longae et 3 mm. latae, in colletrum satis longum exeuns, extus sparse et breviter strigosae, mox deciduae. Inflorescentiae basi foliis duobus ovatis, 2.5 mm. longis instructae; bracteae filiformes breviores vel nullae. Flos subsessilis, 4-merus. Ovarium cylindricum, 4 mm. longum et 0.8 mm. diam., breviter sed dense griseo-strigosum. Calycis lobi lineares, 7–9 mm. longi et 1.2–1.5 mm. lati, acuti, pilis brevibus utrimque sed extus densius griseo-strigosi. Corolla colore ignoto, 1.2 cm. longa, extus breviter sed densissime griseo-strigosa; tubus 7 mm. longus et 3 mm. diam.; lobi ovati, 5 mm. longi et 3.5 mm. lati, acuti. Stamina 6 mm. longa; filamenta 1 mm.; antherae 5 mm. longae. Fructus forsitan nondum plene maturus fide Valeton 1.5–2 cm. longus et 2–2.5 mm. diam., dense sed breviter strigosus.

Habitat terrae Borneënsis partem occidentalem.

BORNEO: Western Division: Sintang, Amai Ambit, *Hallier 3247 b* (L, dupl. typi); Liang Agang, 113° 20′ E.long., 0° 40′ N.lat., *id. 2817 b*, n.v.; Bt. Tilung, 113° 20′ E.long., 0° 45′ N.lat., alt. 800 m., *Winkler 1469* (HBG), n.v.

SUBGENUS H. MITRACME BREM. SUBGEN. NOV.

Herbae subrosulares, ascendentes vel suberectae. Folia laxe reticulatae. Stipulae ovatae vel oblongae, apice plerumque obtusae, internodiis plurimis longiores, extus plerumque hic inde colletris instructae, reticulatae. Inflorescentia terminalis, nunc bis vel semel trichotoma, floribus ad apices ramulorum fasciculatis, nunc umbelliformis. Corolla alba vel dilute tincta, tubo anguste campanulato. Stamina filamentis glabris et liberis, quam antheris multo brevioribus, antheris connectivo nunc ciliolato nunc eciliolato, haud carinato, in appendicem plerumque brevem producto. Discus inconspicuus. Stylus cylindricus; receptaculum pollinis thecis multo brevius, mitriforme. Fructus cylindricus. Semina reticulata vel carunculata.

Species adhuc notae septem terram Borneënsem et insulam Filippinam Mindanao dictam habitantes. Subgeneris typus: *A. velutinervia* Brem. n. spec. v. infra.

KEY TO THE SPECIES

Connective ciliolate. Large plants with twice trichotomous inflorescences provided with large bracts.....Series a. **Ciliolatae**

Leaves 14–20 cm. long, provided with 6 or 7 pairs of nerves; midrib and nerves on the underside velutinous. Calyx-lobes lanceolate-oblong, 13 mm. long. Fruit 3 cm. long and 1.8 mm. diam. — North Borneo.....26. *A. velutinervia*

Leaves 30–35 cm. long, provided with 11 or 12 pairs of nerves; midrib and nerves

on the underside villous or slightly hirsute. Calyx-lobes ovate, 6 mm. long. Fruit 1 cm. long and 4.5 mm. diam. — Widespread in Borneo, but not in the northern part.....27. *A. frutescens*

Connective eciliolate. Low plants with trichotomous or umbelliform inflorescences; bracts, except in *A. philippinensis*, small.

Inflorescences trichotomous. Leaves with 7–11 pairs of nerves.

Leaves obovate, velutinous on the upper side at least at first, on the underside on midrib and nerves persistently. Stipules neither scarious nor early deciduous.....Series b. **Philippinenses**

One species only. — Mindanao.....28. *A. philippinensis*

Leaves lanceolate, on the upper side entirely glabrous, strigose on the underside on midrib and nerves. Stipules scarious and early deciduous.....Series c. **Iteophyllae**

One species only. — Central and West Borneo.....29. *A. lanceolata*

Inflorescences umbelliform. Leaves with 5–8 pairs of nerves.....Series d. **Umbelliflorae**

Midrib strigose towards the leaf-base on the upper side. Calyx-lobes linear or lanceolate.

Leaves lanceolate, entirely green. Stipules oblong and acute. — Central Borneo.....30. *A. Nieuwenhuisii*

Leaves lanceolate-elliptic or obovate, variegated. Stipules ovate and obtuse. — Central Borneo.....31. *A. Hallierii*

Leaves entirely glabrous on the upper side. Calyx-lobes ovate-lanceolate. — North Borneo.....32. *A. atropella*

SERIES A. CILIOLATAE

Herbae robustiores. Inflorescentia bis trichotoma, floribus 2–5 ad apices ramulorum fasciculatis; bracteae magnae, ad anthesin deciduae. Connectivum ciliolatum. — Species 26 et 27.

26. **Acranthera velutinervia** Brem. n. spec.; typus: *J. & M. S. Clemens 32093* (L).

Herba suberecta, minime 50 cm. alta. Caulis primum breviter sed densissime, deinde minus dense fulvo-strigosus, diametro ad apicem 3 mm., basin versus usque ad 7 mm. aucto, internodiis 1.5–7 cm. longis. Folia petiolo 4.5–5.5 cm. longo, densissime fulvo-strigoso et insuper parce villoso instructa; lamina elliptica, 14–20 cm. longa et 6.5–10.5 cm. lata, apice acuta vel acuminata, basi contracta, margine ciliata, supra basin versus sparsissime strigosa, subtus costa nervisque densissime, inter nervos primum dense, deinde sparsius velutina, utrimque opaca, sicc. supra saturate rubro-brunnea, subtus brunnea, costa nervisque tamen pilorum praesentia fulvo-griseis, nervis utroque latere costae 6 vel 7. Stipulae oblongae, 3–4 cm. longae et 1.2–1.6 cm. latae, obtusae, extus ubique sed costa prominente et margine densius pubescentes, mox deciduae. Inflorescentia subsessilis; ramuli breviter sed densissime fulvo-strigosi, primarii 3–3.5 cm., secundarii 1.5–2 cm. longi; bracteae ramulorum primariorum nondum visae, ramulorum secundariorum lineari-oblongae, 2.5 cm. longae et 5–6 mm. latae, acutae, extus intusque satis dense, margine densius pubescentes, costa prominula, a stipulis parvis connatae, mox deciduae; bracteae aliae gradatim breviores et pro rato latiores; bracteae florales calycis lobis similiores; omnes ad anthesin deciduae. Flores sessiles. Ovarium cylindricum, 8 mm. longum et 1 mm. diam., breviter sed densissime griseo-strigosum. Calycis lobi lanceolato-oblongi, 13 mm. longi et 4 mm. lati,

acuti, extus intusque satis dense, margine densius pubescentes, 7-nervii. Corolla citrina, 18 mm. longa, extus puberulo-pubescens, margine densius pubescente; tubus 13 mm. longus et 3.5 mm. diam.; lobi rotundati 5 mm. longi latique. Stamina 8 mm. longa; filamenta 2 mm.; antherae 6 mm. longae, connectivo in appendicem 0.5 mm. longam producto. Receptaculum pollinis 2 mm. longum et basi 1.4 mm. diam.; stigmata subulata 1 mm. longa. Fructus (*Clemens 26812*) 3 cm. longus et 1.8 mm. diam., sparse pubescens. Semina carunculata.

Habitat terrae Borneënsis partem septentrionalem.

British North Borneo: Mt. Kinabalu: Penibukan, alt. 1200 m., *J. & M. S. Clemens 32095* (L, typus, AA, dupl. typi); Dallas, alt. 900 m.; *id. 26812* (L, AA, co-typus fructifer).

This species is in habit and in the structure of the inflorescence very similar to *A. frutescens* Val. but differs conspicuously from that species in the smaller size of the leaves, the fewer nerves, on the underside velutinous, the longer and narrower calyx-lobes and the longer and narrower ovaries and fruits.

27. **Acranthera frutescens** Val. in Engl., Bot. Jahrb. 44: 551. 1910, et in Ic. Bog. 4: 286. 1914 in adnot. ad *A. multifloram* Val.; non Merr. in Univ. Calif. Publ. Bot. 15: 280. 1929, quae est species affinis nondum descripta; — anne *A. multiflora* Val. in Ic. Bog. 4: 286, t. 396. 1914, adhuc incertum, sed haud improbabile v. infra).

Herba suberecta, 1.5–2 m. alta. Caulis primum villosus vel hirsuto-villosus, deinde glabrescens, diametro ad apicem 8 mm., basin versus usque ad 11 mm. aucto, internodiis 1.2–3 cm. longis. Folia petiolo 3–8 cm. longo, primum villoso vel hirsuto-villoso, deinde plus minusve glabrescente instructa; lamina obovata, 30–35 cm. longa et 10–12 cm. lata, apice caudato-acuminata, basi cuneata vel contracta, margine primum dense, deinde sparse substrigosa, primum insuper sparse ciliata, supra primum praesertim basin versus sparse strigosa, ultimo plus minusve glabrescens, subtus primum costa nervisque dense villosa vel hirsuto-villosa et inter nervos breviter sed satis dense strigosa, deinde costa nervisque sparsius villosa vel hirsuto-villosa et inter nervos vix conspicue strigosa, utrimque opaca, sicc. supra nigrescens et subtus fuscescens, nervis utroque latere costae 11 vel 12. Stipulae oblongae, 2.5 cm. longae et 1 cm. latae, obtusae, extus satis dense villosae vel hirsuto-villosae, costa vix prominula, mox deciduae. Inflorescentia subsessilis; ramuli dense fulvo-villosi, primarii ad anthesin circ. 1 cm., secundarii 7 mm. longi, post anthesin primarii usque ad 2.5 cm. et secundarii usque ad 1.5 cm. elongati; bracteae ovatae, 6–10 mm. longae et 3.5–6 mm. latae, extus et praesertim margine pubescentes, mox deciduae. Flores pedicello 0–2.5 mm. longo elati. Ovarium ovoideum, 2.5 mm. longum et 1.5 mm. diam., dense griseo-villosulum. Calycis lobi ovati, 6 mm. longi et 3–3.5 mm. lati, acuti, extus ubique sed margine densius pubescentes, 5-nervii, post anthesin usque ad 7 mm. longi et 5 mm. lati. Corolla viridula, extus griseo-villosula, fide Valeton 14–16 mm. longa; tubus 10–12 mm. longus; lobi late ovati, 4 mm. longi, acuti. Stamina 7 mm. longa, connectivo in appendicem filiformem 3 mm. (?) longam contracto. Fructus late cylindricus, 10 mm. longus et 4.5 mm. diam., villosus. Semina carunculata.

Habitat terrae Borneënsis partes occidentalem, australem et orientalem.

BORNEO: Southern and Eastern Division: Samarinda, between Semurung (S. Pasir) and S. Tarik, *Hub. Winkler 3032* (BD, typus), n.v.; West Kutai, near h. Puhus, alt. 90 m., *Endert 2501* (BZ). Western Division: Singkawang, district Landak, Ngabang, *Teysmann H.B. 11220* (L).

SARAWAK: Mt. Rayon, alt. 180 m., *Nat. coll. Ser. Mus. 5039* (AA); Mt. Matang, alt. 450 m., *J. & M. S. Clemens 22360* (AA).

The description given above has mainly been based on Endert's specimen. It deviates in the following points from the original one, given by Valeton: the number of pairs of nerves is 11 or 12, not 16; the bracts are slightly smaller (6–10 mm. × 3.5–6 mm. instead of 13 mm. × 8 mm.) and the calyx-lobes too are smaller (6 mm. × 3–3.5 mm. instead of 8 mm. × 5 mm.). The difference in the number of pairs of nerves is probably uncertain. As a comparison of Valeton's descriptions with the accompanying figures in the Icones Bogorienses prove, all nerves springing from the midrib were counted by him as primary ones, whereas I restrict the term to those which are readily comparable, leaving out the weaker nerves inserted in the intervals between the stronger ones. The differences in size of the bracts and the calyx-lobes offer a more serious difficulty, but these dimensions are probably rather variable.

Acranthera multiflora Val. in Ic. Bog. 4: 286, t. 396. 1914, is probably conspecific. The details of the flower-structure given by Valeton, are not to be trusted. I have little doubt that his flowers were both too young and badly preserved, and Valeton himself, as the remarks at the end of his description prove, attached no value to these details. In the Sarawak specimens quoted above, which agree well with Valeton's figure, the thecae are ciliolate and the *receptaculum pollinis* mitriform. The most important difference lies in the greater length of the fruits, which are said to be 2 cm. long. It is, of course, possible that a comparison of the authentic specimens will reveal the presence of differences not mentioned in the description, and that more than one species will have to be recognized, but for the present I prefer to consider them conspecific.

Elmer 20838, collected near Tawao in British North Borneo, and referred by Merrill l.c. to *A. frutescens*, differs in the size of the leaves and in the fewer nerves. It resembles in these characters *A. velutinervia*, from which it differs in the nature of the indumentum and above all by the short fruits, which are more like those of *A. frutescens*. It is doubtless an undescribed species, but as there were no flowers in the specimens which I could investigate, I am unwilling to describe it. As the flowers are described by Elmer as pale green, it is very probable that they will have been preserved at least in some of his specimens.

SERIES B. PHILIPPINENSES

Herba ascendens, valde pilosa. Stipulae extus sine colletris. Inflorescentia trichotoma. Corolla extus tomentosa. Connectivum eciliolatum. Placentae utroque loculo ovarii confluentes. Semina reticulata. — Species 28.

28. **Acranthera philippinensis** Merr. in Philip. Jour. Sci. 8: Bot. 32. 1913, Enum. Philip. Fl. Pl. 3: 517. 1923.

Herba ascendens, circ. 60 cm. alta. Caulis dense pubescens, diametro ad apicem 6 mm., basin versus usque ad 8 mm. aucto, internodiis 0.5–2.5 cm. longis. Folia petiolo 2–7 cm. longo, dense pubescente instructa; lamina obovata vel oblanceolata, 9–25 cm. longa et 3–10 cm. lata, apice acuta vel brevissime acuminata, basi cuneata vel contracta, margine densissime pubescens, supra primum velutina, deinde sparse pilosa vel subglabra, a basibus pilorum scabridula, subtus costa nervisque densissime, venulis dense velutina, ceterum sparse pubescens, utrimque opaca, sicc. supra olivacea, subtus fusca, nervis utroque latere costae 8–11. Stipulae ovato-oblongae, 2–2.5 cm. longae et 1.2 cm. latae, subacutae, extus sparse villosae, subpersistentes. Inflorescentia subsessilis; bracteae oblongae, villosae; inferiores 2.5 cm. longae et 1 cm. latae; aliae gradatim minores. Flores subsessiles. Ovarium cylindricum, 8 mm. longum et 1.4 mm. diam., griseo-tomentosum. Calycis lobi ad anthesin lanceolati, 8 mm. longi et 2.8 mm. lati, fructu spathulati, 14 mm. longi et 3 mm. lati, extus intusque satis dense, margine densius pubescentes. Corolla alba vel rosea, extus tomentosa, margine longius ciliata; tubus 7 mm. longus et 3.5 mm. diam.; lobi rotundati, 2.5 mm. longi latique. Stamina 6.5 mm. longa; filamenta 1 mm.; antherae 5.5 mm. longae, connectivo apiculato. Receptaculum pollinis 1 mm. longum et basi 1 mm. diam. Fructus 2.5 cm. longus et 4 mm. diam. Semina reticulata.

Habitat insulam Filippinam Mindanao dictam.

MINDANAO: Zamboanga, *Merrill 8309* (L, exemplum typi); *Ramos & Edaño B.Sc. 36647* (L); also near lake Lanao.

This species appears to be confined to the western part of Mindanao. As its nearest allies are found in Borneo, it would be interesting to know whether the genus is perhaps represented in the Sulu Islands too.

SERIES C. ITEOPHYLLAE

Herba ascendens. Folia anguste lanceolata, supra glaberrima. Stipulae scariosae. Inflorescentia semel trichotoma, floribus 3–5 ad apices ramulorum fasciculatis; bracteae parvae, mox deciduae. Connectivum eciliolatum. Discus squamis parvis cum filamentis alternantibus substitutus. — Species 29.

29. **Acranthera lanceolata** Val. in Ic. Bog. 4:282, t. 394. 1914; Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 283. 1937.

Herba ascendens, circ. 30 cm. alta, interdum pseudo-dichotome ramificata. Caulis pilis brevissimis primum densissime, deinde sparsius fulvo-strigosus, diametro ad apicem 2 mm., basin versus usque ad 4 mm. aucto, internodiis 0.5–3 cm. longis. Folia petiolo 1.5–2.5 cm. longo, pilis brevibus densissime fulvo-strigoso instructa; lamina lineari-lanceolata vel lanceolata, 6–10.5 cm. longa et 1.3–2.0 cm. lata, ter usque ad sexies longior quam latior, apice caudato-acuminata, basi acuta vel cuneata, margine dense strigosa, supra glaberrima, subtus costa nervis necnon venulis principalibus a pilis brevibus primum albidis, deinde fulvis, primum densissime, deinde sparsius strigosa, primum supra nitidula, deinde utrimque opaca, sicc. supra nigrescens, subtus fuscescens, nervis utroque latere costae 7–11,

venulis subtus colore saturatiore conspicuis. Stipulae oblongae, 18 mm. longae et 7 mm. latae, apice obtusae, extus pilis brevissimis sparsae. scariosae, sicc. brunnescentes, costa basin versus prominente, mox deciduae. Inflorescentia subsessilis; rachis et ramuli pilis brevissimis densissime fulvo-strigosi; rachis 1.5–2.5 cm., ramuli 0.6–1.0 cm. longi; bracteae ovato-lanceolatae, circ. 2 mm. longae, extus sparse, margine densius pubescentes, mox deciduae. Flores breviter pedicellati. Pedicellus 0.5–2 mm. longus. Ovarium cylindricum, 6 mm. longum et 1.2 mm. diam., pilis brevissimis densissime fulvo-strigosum. Calycis lobi ovato-lanceolati, 6.5 mm. longi et 2.7–3.5 mm. lati, subobtusi, extus intusque pilis brevibus sparse, margine densius strigosi, 5-nervii. Corolla alba vel luteola, 10.5 mm. longa, extus pilis brevibus substrigosa; tubus 8 mm. longus et 3 mm. diam.; lobi 2.5 mm. longi latique, subobtusi. Stamina 7 mm. longa; filamenta 1.8 mm.; antherae 5.2 mm. longae, connectivo in appendicem anguste triangularem, 1.2 mm. longam producto. Receptaculum pollinis 1.3 mm. longum, basi 1.2 mm. diam. Fructus pedicello usque ad 3 mm. elongato elatus, 1.8 cm. longus et 2.2 mm. diam., sparse pubescens. Semina carunculata.

Habitat terrae Borneënsis partes centralem et orientalem.

CENTRAL BORNEO: Tadjuk, *Nieuwenhuis 206* (1896/97); S. Haraseh, *id. 214* (1896/97); S. Senoon, *id. 30* (1898), omnes fide *Valeton* l.c. Western Division; S. Serawai near Djotta, 112° 30′ E.long., 0° 30′ S.lat., alt. 100 m., *Winkler 323*, fide *Merill* l.c.

SARAWAK: Saribas, Paku, *Haviland & Hose 1562* (L).

The description given above has been based on the specimen collected by *Haviland & Hose*, but agrees in all essential points with that given by Valeton. The latter says of the inflorescences "vulgo tres in apice caulis umbellatae," but this is doubtless a mistake, for inflorescences arranged in this way are entirely unknown in this genus; the short common peduncle has apparently been overlooked. The *receptaculum pollinis*, which he in the usual way takes for the stigma, is accurately described as "conicum acutum," but badly represented in fig. 6, where it shows an ovoid shape.

This species is easily recognizable among all its allies by the narrowly lanceolate leaves. A rather curious feature are the five small disk-scales alternating with the stamens.

SERIES D. UMBELLIFLORAE

Herbae ascendentes vel subrosulares. Inflorescentia umbelliformis; bracteae parvae. Connectivum eciliolatum. — Species 30–32.

30. **Acranthera Nieuwenhuisii** Val. in sched.; typus: *Jaheri* (Exped. *Nieuwenhuis*) *754* (L).

Herba ascendens, circ. 15 cm. alta. Caulis primum breviter sed densissime, deinde sparsius fulvo-strigosus, diametro ad apicem 1.7 mm., basin versus usque ad 2.5 mm. aucto, internodiis 8–12 mm. longis. Folia petiolo 7–10 mm. longo, breviter sed densissime fulvo-strigoso instructa; lamina lanceolata, 7–11 cm. longa et 2–3.3 cm. lata, apice acuta vel acuminata, basi acuta vel subacuta, margine dense strigosa, supra costa quae basin versus est dense fulvo-strigosa excepta glaberrima, subtus costa nervisque

densissime, venulis principalibus sparsius strigosa, utrimque opaca, sicc. supra saturate brunnea, subtus fusca, nervis utroque latere costae 5 vel 6. Stipulae oblongae, 1.7 cm. longae et 5.5 mm. latae, apice acutae, extus pilis brevibus sparsae, margine ciliatae, sicc. brunneae, costa praesertim basin versus prominente, ante folia deciduae. Inflorescentia subsessilis, circ. 6-flora, basi bracteis linearibus 5 mm. longis et 0.5 mm. latis instructa. Flores pedicello circ. 10 mm. longo, breviter sed densissime fulvo-strigoso elati. Ovarium cylindricum, 8 mm. longum et 1 mm. diam., ut pedicellus densissime fulvo-strigosum. Calycis lobi lineares, 11 mm. longi et 1.5–1.8 mm. lati, caudato-acuminati, extus intusque pilis brevibus sparse, margine dense strigosi, 3- vel 5-nervii. Corolla colore ignoto, 2 cm. longa, extus breviter strigosa; tubus 14 mm. longus et 4.5 mm. diam.; lobi ovati, 5.5 mm. longi et 3.5 mm. lati, acuti. Stamina 9 mm. longa; filamenta 3 mm.; antherae 6 mm. longae, connectivo in appendicem anguste triangularem, 1.3 mm. longam exeunte. Stylus basi paulum incrassatus; receptaculum pollinis 2.5 mm. longum et basi 0.8 mm. diam.; stigmata subulata 1.5 mm. longa. Fructus nondum notus.

Habitat terrae Borneënsis partem centralem.

CENTRAL BORNEO: s.l., *Jaheri* (Exped. Nieuwenhuis) *754* (L, typus).

Acranthera Nieuwenhuisii comes very near to *A. Hallierii* Val., from which it differs in the greater length of the internodes, the lanceolate, entirely green, less conspicuously ciliated leaves, the oblong stipules, the linear calyx-lobes and the greater length of the points in which the connectives are drawn out. Both species are in general aspect not unlike some species belonging to the subgenus *Dichroanthes*, namely *A. variegata* Merr. and *A. aurantiaca* Val. ex Brem., from which they are, of course, easily distinguishable by the eciliolate anthers and the mitriform *receptaculum pollinis*, and probably also by the colour of the corolla. It is true that the colour of the corolla in *A. Nieuwenhuisii* is unknown, but as that of *A. Hallierii* is said to be white, there is good reason to assume that the flowers of *A. Nieuwenhuisii* too will be white.

31. **Acranthera Hallierii** Val. in Ic. Bog. 4: 183, t. 356. 1913.

Herba subrosularis. Caulis ad apicem pilis satis longis strigosus, basin versus glabrescens, diametro ad apicem 2 mm., basin versus usque ad 3.5 mm. aucto, internodiis circ. 5 mm. longis. Folia petiolo 0.5–2.5 cm. longo, primum dense, deinde sparsius strigoso instructa; lamina elliptico-lanceolata vel obovata, 6.5–11 cm. longa et 2.5–4.5 cm. lata, apice acuta vel subacuminata, basi acuta vel subtruncata et prope petiolum subito contracta, margine densissime et satis longe strigosa, supra costa quae basin versus est sparse strigosa excepta glaberrima, subtus costa nervisque densissime, venulis sparsius et brevius strigosa, utrimque opaca, variegata, sicc. supra saturate brunnea, subtus fusca, nervis utroque latere costae 6 vel 7. Stipulae ovatae, 13 mm. longae et 6 mm. latae, obtusae, extus sparse strigosae, costa prominula, deciduae. Inflorescentia subsessilis, e floribus 2–6 composita; bracteae angustae, vix conspicuae. Flores pedicello usque ad 1.5 cm. longo, pilis brevibus dense griseo-strigoso elati. Ovarium cylindricum, 5 mm. longum et 1 mm. diam., ut pedicellus dense griseo-strigosum. Calycis lobi lanceolati, 8.5 mm. longi et 1.7–2 mm. lati,

acuti, extus sparse, costa et margine densius strigosi. Corolla alba, 17 mm. longa, extus pilis brevibus dense strigosa; tubus 11 mm. longus et 5 mm. diam.; lobi ovato-triangulares, 6–7 mm. longi et 3 mm. lati. Stamina 10 mm. longa; filamenta 3 mm.; antherae 7 mm. longae, connectivo in appendicem vix 0.5 mm. longam producto. Receptaculum pollinis 2 mm. longum et basi 0.8 mm. diam.; stigmata subulata 0.5 mm. longa. Fructus nondum notus.

Habitat terrae Borneënsis partem centralem.

CENTRAL BORNEO: s.l., *Amdjah* (Exped. *Nieuwenhuis*) *310* (L, exemplum typi).

The figure and description given by Valeton of the *receptaculum pollinis* are wrong, and the white patches of the leaves are neither mentioned nor shown.

32. **Acranthera atropella** Stapf in Trans. Linn. Soc. Bot. II, 4: 173. 1894. — British North Borneo.

Specimens of this species were collected by Low & Haviland on the slopes of Mt. Kinabalu at an altitude of 1500–1800 m. It reaches, therefore, a greater height than any of its allies. Its position in the subgenus *Mitracme* is not yet fully assured, for Stapf describes the *receptaculum pollinis*, which he too confuses with the stigma, as capitate, but as his description in other respects closely resembles those given above of *A. Nieuwenhuisii* and *A. Hallierii*, I have little doubt that its *receptaculum pollinis* is in reality mitriform. The corolla has been described as "obscure cyaneum," but this may be the colour it assumes in the herbarium: the flowers of the other Bornean species are, at least in the living state, never blue. The similarity between this species and *A. Hallierii* has been noticed already by Valeton, who, however, gave an erroneous interpretation of the structure of their inflorescences (cf. Ic. Bog. 4: 182. 1913). He thought that the flowers were in reality axillary, the umbellate arrangement being simulated by the shortness of the upper internodes, but in *A. Hallierii* the flowers are by no means subtended by ordinary leaves, but by minute bracts, and the inflorescence is doubtless cymoso-umbellate. Stapf describes the flowers of *A. atropella* as "pseudo-umbellate," but this means probably that the flowers do not open centripetally, as in a true umbel, but centrifugally. As he says that the inflorescence is sessile and at the base surrounded by the two upper pairs of leaves with their stipules, the possibility that the flowers might be axillary, seems excluded. True umbels are probably unknown in the whole family; when the flowers are fascicled at the top of a common peduncle, the arrangement always seems to be entirely or partly cymose.

Stapf mentions a minute white punctation of the upper side of the leaves caused by collapsed cells. This punctation has also been observed in *A. Nieuwenhuisii* and in the three species belonging to the next subgenus.

SUBGENUS I. ATHROOPHLEPS BREM. SUBGEN. NOV.

Herbae ascendentes vel suberectae. Folia supra sub lente cellulis collapsis albo-punctata, venulis ad nervos plus minusve perpendicularibus

et valde approximatis utrimque transverse striata. Stipulae oblongae vel obovatae, obtusae, internodiis superioribus subaequilongae, dense reticulatae, plerumque deciduae. Inflorescentia terminalis. Flores sessiles vel subsessiles. Ovarium turbinatum. Corolla alba, tubo anguste campanulato. Stamina filamentis glabris et liberis, quam antheris multo brevioribus, antheris eciliolatis, connectivo in appendicem filiformem producto. Discus inconspicuus. Stylus cylindricus; receptaculum pollinis annulare. Fructus cylindricus.

Species adhuc notae tres terrae Borneënsis partem septentrionalem habitantes. Subgeneris typus: *A. athroophlebia* Brem. n. spec. v. infra.

KEY TO THE SPECIES

Flowers laxly paniculate; bracts deciduous. Leaves, calyx and corolla, apart from the ciliate margin, entirely glabrous. — North Borneo.....33. *A. athroophlebia*
Flowers subcapitate; bracts persistent. Leaves on the underside, at least on the nerves, as well as calyx-lobes and outside of the corolla, pubescent.
Leaves with 6–10 pairs of nerves; midrib and nerves hirto-pubescent on the underside. Stipules early deciduous. — North Borneo.....34. *A. capitata*
Leaves with 4–5 pairs of nerves; midrib and nerves strigose on the underside. Stipules subpersistent. — North Borneo.....35. *A. Ruttenii*

33. **Acranthera athroophlebia** Brem. n. spec.; typus: *J. & M. S. Clemens 30616* (L).

Herba suberecta, usque ad 90 cm. alta. Caulis sulcis interdum primum pulverulentus, mox totus glabrescens, diametro ad apicem 5 mm., basin versus usque ad 10 mm. aucto, internodiis superioribus 3–7 cm. longis, sicc. nigrescens. Folia petiolo 4–5 cm. longo, glabro, sicc. nigrescente instructa; lamina oblanceolata vel obovata, 16–29 cm. longa et 4.7–10 cm. lata, apice acuta vel sensim et vix conspicue acuminata, basi cuneata, margine parce sed longius ciliata, ceterum glabra, utrimque opaca, sicc. supra nigrescens, subtus fuscescens, nervis utroque latere costae 6–8. Stipulae oblongae, 2–3 cm. longae et 1–1.5 cm. latae, apice rotundatae, interdum tamen breviter mucronatae, costa prominente, extus glabrae, deciduae. Inflorescentia nunc subsessilis nunc pedunculo usque ad 3 cm. longo elata, laxe paniculiformis; rachis ad anthesin circ. 7 cm. longa, postea usque ad 18 cm. elongata; rachis ramulique glabri, sicc. nigrescentes; ramuli ultimi monochasiales, post anthesin usque ad 5 cm. elongati, multiflori; bracteae ovatae, concavae et basi saccatae, plerumque circ. 1 cm. longae, margine dense ciliatae, ceterum glabrae, sicc. fuscescentes, ad anthesin deciduae. Flores subsessiles. Ovarium 5 mm. longum et 2.7 mm. diam., glabrum. Calycis lobi oblongi, 7.5 mm. longi et 2.5 mm. lati, acuti, margine ciliati, ceterum glabri, nervis circ. 7 quorum 3 fortiores instructi. Corolla margine ciliata, ceterum glabra; tubus 9 mm. longus et 4 mm. diam.; lobi ovati, 4 mm. longi et 3 mm. lati, acuti, dimidio superiore reflexo et reduplicato. Stamina 7 mm. longa; filamenta 1.8 mm.; antherae 5.2 mm. longae, connectivo carinato in appendicem contortam, 1.7 mm. longam producto. Stylus supra receptaculum pollinis obtusus. Fructus late cylindricus, 15 mm. longus et 4 mm. diam., glaber. Semina reticulata.

Habitat terrae Borneënsis partem septentrionalem.

British North Borneo: Mt. Kinabalu, Penibukan, alt. 1200 m., *J. & M. S. Clemens 30616* (L, typus, AA, dupl. typi, BZ, tripl. typi); *id. 31308* (AA), *32136* (L, AA).

In the colour which it assumes in drying, and in the presence of collapsed cells on the upper side of the leaves, this species resembles *A. atropella* Stapf, from which it differs, however, conspicuously in its almost complete glabrescence, in the larger size of the leaves and stipules, and above all in the paniculately arranged, subsessile flowers. As Stapf states that in his species the venules are indistinct, the possibility that it might belong to the subgenus *Athroophleps*, need not be taken seriously.

The differences between this species and the two next ones have been summarized in the key.

34. **Acranthera capitata** Val. in Ic. Bog. 4: 275, t. 391. 1914.

Herba ascendens, circ. 30 cm. alta, post anthesin decumbens et ex axillis inferioribus innovationes emittens. Caulis primum pilis rufo-fuscis breviter pubescens, deinde glabrescens, diametro ad apicem 2.5 mm., basin versus usque ad 7 mm. aucto, internodiis superioribus 0.5–3 cm. longis, inferioribus usque ad 7 cm. longis, sicc. fuscescens. Folia petiolo 2.5–7 cm. longo, dense pubescente, sicc. olivaceo-brunneo instructa; lamina elliptica vel saepius obovata, 13–25 cm. longa et 6.5–9 cm. lata, subobtusa vel vix conspicue acuminata, basi acuta vel saepius cuneata, margine dense ciliata, supra primum pubescens, mox glabrescens, subtus costa nervis nec non venulis fortioribus dense hirto-pubescens, ceterum subglabra, utrimque opaca, sicc. supra saturate olivacea, subtus fusca, nervis utroque latere costae 6–10. Stipulae ellipticae vel obovatae, 12–15 mm. longae et 8–12 mm. latae, apice rotundatae, costa basin versus prominente, extus primum satis dense, costa densius pubescentes, margine dense ciliatae, deciduae. Inflorescentia breviter pedunculata, plus minusve capituliformis, re vera pentachotome corymbosa, ramulis brevissimis; pedunculus dense hirto-pubescens, 1–2 cm. longus, recurvatus; bracteae exteriores ovatae, 12 mm. longae et 7 mm. latae; aliae gradatim minores et praesertim angustiores; omnes sicc. fuscescentes, extus sparse, intus densius pubescentes, margine dense ciliatae, ad anthesin persistentes. Flores sessiles. Ovarium 3 mm. longum et 1.2 mm. diam., dense griseo-pubescens. Calycis lobi lanceolati, 5 mm. longi et 1.8 mm. lati, acuti, margine ciliati, extus intusque pubescentes, nervis 3 vel 5 quorum 3 fortiores instructi. Corolla extus parce pubescens, margine ciliata; tubus 7 mm. longus et 4 mm. diam.; lobi 2.8 mm. longi et 1.9 mm. lati, acuti. Stamina 6.7 mm. longa; filamenta 1.6 mm.; antherae 5.2 mm. longae, connectivo vix conspicue carinato in appendicem rectam, 0.9 mm. longam producto. Fructus glaber dictus, nondum plene maturus 10 mm. longus et 2 mm. diam.

Habitat terrae Borneënsis partem septentrionalem.

BORNEO: Eastern and Southern Division, Tidoong: Ulu Sebulu, *Amdjah 634* (L, dupl. typi); S. Tulit, *id. 664* (L).

According to Valeton l.c. the flowers of *Amdjah 664* should be violet, those of the other specimens white; maybe the colour changes before the corolla is shed.

The differences between this species and *A. Ruttenii* Brem. are given in the key. Although rather different in aspect, they are doubtless nearly related.

35. **Acranthera Ruttenii** Brem. n. spec.; typus: *Rutten 642* (U).

Herba suberecta, circ. 60 cm. alta, post anthesin decumbens et ex axillis inferioribus innovationes emittens. Caulis primum pilis longis strigosus, deinde glabrescens, diametro ad apicem 1.5 mm., basin versus usque ad 3 mm. aucto, internodiis superioribus 0.8–1.5 cm. longis, inferioribus usque ad 11.5 cm. longis, sicc. saturate olivaceus. Folia petiolo 1.5–2.5 cm. longo, dense strigoso-villoso, sicc. olivaceo instructa; lamina lanceolata vel obovata, 8–11 cm. longa et 4–5 cm. lata, apice acuminata, basi contracta, margine dense ciliata, supra primum sparse villosa, deinde glabrescens, subtus costa nervis nec non venulis fortioribus dense strigosa, ceterum glabra, utrimque opaca, sicc. supra olivacea, subtus dilute fusca, nervis utroque latere costae 4 vel 5. Stipulae oblongo-ellipticae, 13–15 mm. longae et 8–9 mm. latae, apice truncatae, costa basin versus prominente, extus primum praesertim costa parce villosae, margine primum densius ciliatae, subpersistentes. Inflorescentia pedunculata, capituliformis; pedunculus dense griseo-pubescens, circ. 1 cm. longus, patens; bracteae exteriores ovatae, 13 mm. longae et 7.5 mm. latae; aliae angustiores; omnes sicc. fuscescentes, extus sparse et intus densius pubescentes, margine dense ciliatae, ad anthesin persistentes. Flores sessiles. Ovarium 4 mm. longum et 2.2 mm. diam., dense griseo-pubescens. Calycis lobi lineari-lanceolati vel lineari-oblongi, 7.5 mm. longi et 1.8–2.2 mm. lati, acuti, margine ciliati, extus vix conspicue, intus densius pubescentes, nervis circ. 5 quorum 3 fortiores instructi. Corolla extus sericeo-villosa, margine ciliata; tubus 7 mm. longus et 3 mm. diam.; lobi 2.7 mm. longi et 2 mm. lati, acuti. Stamina 6.5 mm. longa; filamenta 1 mm.; antherae 5.5 mm. longae, connectivo vix conspicue carinato in appendicem rectam, 0.7 mm. longam producto. Fructus nondum notus.

Habitat terrae Borneënsis partem septentrianalem.

BORNEO: Eastern and Southern Division: Bulongan, S. Sadjau, 117° 40′ E.long., 2° 40′ N.lat., *Rutten 642* (U, typus).

INDEX SPECIERUM

21. *abbreviata* Val. in Ic. Bog. 4: 181, t. 355. 1913 — West Borneo.
1. *anamallica* Bedd., Ic. Pl. Ind. Or. 1: 5, t. 23. 1874 — Indian Peninsula.
33. *athroophlebia* Brem. n. spec. — North Borneo.
32. *atropella* Stapf in Trans. Linn. Soc. Bot. II, 4: 173. 1894 — North Borneo.
16. *aurantiaca* Val. ex Brem. n. spec. — West Borneo.
20. *axilliflora* Val. in Bot. Jahrb. 44: 550. 1910 — South-east Borneo.
12. *bullata* Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 284. 1937 — West Borneo.
34. *capitata* Val. in Ic. Bog. 4: 275, t. 391. 1914 — North Borneo.
3. **ceylanica* Arn. ex Meisn., Pl. Vasc. Gen. 2: 115. 1838 — Ceylon.
didymocarpus H. H. W. Pearson ex Ridl. in Jour. Fed. Mal. States Mus. 4: 32. 1909, in syn.: *Gardenia didymocarpus* Ridl.
24. *Endertii* Brem. n. spec. — East Borneo.
27. *frutescens* Val. in Bot. Jahrb. 44: 551. 1910 — Borneo, North Borneo excepted.
2. *grandiflora* Bedd., Ic. Pl. Ind. Or. 1: 5, t. 25, 1874 — Indian Peninsula.
Griffithii Hook.f., Fl. Brit. Ind. 3: 92. 1880 = *Asemanthia Griffithii* (Hook.f.) Brem. n. comb.

31. *Hallierii* Val. in Ic. Bog. 4: 183, t. 356. 1913 — Central Borneo.
22. *hirtistipula* Val. in Ic. Bog. 4: 277, t. 392. 1914 — Central Borneo.
11. *involucrata* Val. in Ic. Bog. 4: 279, t. 393. 1914 — West Borneo.
13. *Johannis-Winkleri* Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 285. 1937 — West Borneo.
29. *lanceolata* Val. in Ic. Bog. 4: 281, t. 394. 1914 — Central and West Borneo.
8. *longipes* Merr. in Papers Mich. Acad. Sci. 19: 194. 1934 — East Sumatra.
longipes Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 284. 1937, homonym. illeg.= *longipetiolata*.
19. *longipetiolata* Merr. ex Brem. n. nom. (*longipes* Merr. 1937, non 1934) — West Borneo.
23. *maculata* Val. in Ic. Bog. 4: 283, t. 395. 1914 — Central Borneo.
Maingayi Hook.f., Fl. Brit. Ind. 3: 92. 1880=*Asemanthia Maingayi* (Hook.f.) Ridl. in Kew Bull. 1939: 600. 1939.
18. *megaphylla* Brem. n. spec. — Borneo.
14. *monantha* Val. in Bot. Jahrb. 48: 111. 1912 — North (?) Borneo.
multiflora Val. in Ic. Bog. 4: 285, t. 396. 1914, probabiliter=*frutescens*.
multinervia Val. in sched. cf. *bullata*.
mutabilis Hemsl. in Jour. Bot. 25: 204. 1887 (Mussaenda mutabilis Hemsl. in Hook., Ic. Pl. t. 1718. 1887)=*Asemanthia Maingayi* (Hook.f.) Ridl. in Kew Bull. 1939: 600. 1939.
mutica Val. in sched. cf. *simalurensis*.
30. *Nieuwenhuisii* Val. ex Brem. n. spec. — Central Borneo.
7. *ophiorrhizoides* Val. in Ic. Bog. 4: 287, t. 397. 1914 — North Borneo.
25. *parviflora* Val. in Ic. Bog. 4: 289, t. 398. 1914 — West Borneo.
28. *philippinensis* Merr. in Philip. Jour. Sci. Bot. 8: 32. 1913 — Mindanao.
35. *Ruttenii* Brem. n. spec. — North Borneo.
17. *salmonea* Brem. n. spec. — East Borneo.
5. *siamensis* (Kerr) Brem. n. comb. (Psilobium siamense Kerr in Hook., Ic. Pl. t. 3332. 1937) — Peninsular Siam.
6. *siliquosa* Brem. n. spec. — East Borneo.
10. *simalurensis* Brem. n. spec. — Simalur.
strigosa Val. in Ic. Bog. 4: 291, t. 399. 1914, species incertae sedis nondum visa — Central Borneo.
4. *tomentosa* R.Br. ex Hook.f., Fl. Brit. Ind. 3: 92. 1880 — Assam.
uniflora (Wall. ex G. Don) Kurz in Jour. As. Soc. Bengal 41 (2): 312. 1872 (Mussaenda uniflora Wall. ex G. Don)=*Aphaenandra uniflora* (Wall. ex G. Don) Brem. in Blumea, Suppl. 1: 121. 1937.
15. *variegata* Merr. in Mitt. Inst. Allg. Bot. Hamburg 7: 285. 1937 — West Borneo.
26. *velutinervia* Brem. n. spec. — North Borneo.
9. *Yatesii* Merr. in Papers Mich. Acad. Sci. 19: 194. 1934 — East Sumatra.
zeylanica Arn. in Ann. Nat. Hist. 3: 21. 1839=*ceylanica*.

ZEIST,
HOLLAND.